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ABSTRACT

From a random sample of high school juniors and seniors in northeastern Wisconsin, this study obtained information concerning the subjects' participation in water recreation activities, their perceptions of water quality, and attitudinal data in related areas. The data obtained from the questionnaire were analyzed by chi-square methods to check for differences in subgroups of the population. Most popular activities were identified in order as swimming, boating, fishing, waterskiing, sailing, and duck hunting. Attitudes toward facilities and environmental conditions as well as allocation of funds for recreational purposes varied within different categories of water-recreation participants and when compared to non-participants. (LS)

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MARINE RECREATIONAL USES OF GREEN BAY: A SURVEY OF HUMAN BEHAVIOR AND ATTITUDE PATTERNS OF HIGH SCHOOL JUNIORS AND SENIORS

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CHAPTER I

INTRODUCTION

The New "Age of Majority"

> "There is strong authority for the view that the age of 21 years [as the age of majority] was directly linked with the ability to hold up a heavy suit of armor and lift a lance at the same time. There is also a view that suits of armor were too expensive to be furnished to these under the age of 21 years who might grow out of them. In any event 21 years, the knightly age of majority, filtered down and became the universal age of all classes."[1]

While the knightly age of majority was abandoned long ago in favor of 18 year olds serving in our armed forces, the right to vote and subsequent stake in political affairs were denied 18, 19 or 20 year olds until the passage of the 26th ammendment to the U.S. constitution in July 1971. With the lowering of the age of majority in Wisconsin in March 1972, 18, 19 and 20 year olds were granted all of the rights and responsibilities of adulthood.[2] While the passage of this legislation occurred recently little is known about these new members of the electorate except for their purchasing power. The assumption that they will think and vote as their parents think and vote is as unsubstantiated as the counter assumption. It is assumed they are more environmentally aware than their parents, but are they? If they are more aware, and willing to pay to abate degradation, will these attitudes hold up when they assume major taxpaying responsibilities? While only longitudinal studies will help us to understand the lasting impacts of ecology courses and "earth weeks," baseline information on the present young adult population is needed to provide insights into this groups' voting and decision making behavior.

Besides a lower age of majority, there is an increasing proportion of young people (24 and younger in the present population) further magnifying their role in natural resources decision making. The 1970 census revealed

that 45.3 percent of the Great Lakes Basin States' 74,088,323 population was under 25 years of age. In Wisconsin, 47.3 percent of the population in 1970 was under 25. The fact that there are more young people today many of whom are eligible to vote has magnified their potential impact in public decision making. Because much of the fiscal burden for solving today's environmental problems along with the problems themselves will fall to coming generations, water quality and recreation policy formulation will need to reflect the wishes and opinions of the young adult constituency. It is important, therefore, that as much as possible be learned about their use of the environment for recreation, their recognition of problems, their willingness to allocate more funds for water quality improvement, and related attitudes.

Related Literature

It might be assumed that young adults are well-equipped to accept their adult responsibilities in natural resources decision making but research focusing on high school students' knowledge of pollution (Towler and Swan, 1972) suggests, disconcertingly, that students are not knowledgeable about their environment and the causes of environmental problems. Swan also notes in probing high school youths' responses to air pollution that their environmental concern was not correlated with knowledge about air pollution but rather with awareness of air pollution. It appears that people have trouble understanding technical terms and explanations for pollution and prefer to deal with what they perceive to be the problem.

In addition to the perceptions and attitudes of high school age populations, it would be useful to know more about their recreation behavior patterns. While their participation rates might be expected to be high, it would be informative to study the distribution of their activity among various water-based pursuits and locations. Previously, the National Recreation Survey (U.S. Outdoor

Recreation Resources Review Commission, 1962) investigated the correlation of age with participation in water-based recreation activities and found that the percent of males and females engaging in water-based recreation activities as well as their rate of participation generally declined with increasing age. Participation in swimming and fishing was most intensive for the 18 to 24 year age group, while boating participation rates were greatest in the 25 to 44 year age group, perhaps reflecting income capability for boat ownership.

While there has been extensive research on the water quality requirements and perceptions of both recreation users and representative samples (Barker 1967, Bishop and Aukerman 1970, Willeke 1968, David 1971 and Simpson and Kamitakahara 1971) all have focused on adults or on samples unidentified by age. As yet, there have been no investigations of age differences in water quality requirements, perceptions and related attitudes. For a complete review of the literature cited, refer to pages 39-49 in Wisconsin Sea Grant Program Technical Report #217 by Ditton and Goodale (1972).

Previous Survey Research on Green Bay

The previous survey research of Ditton and Goodale studied only the recreation behavior and water quality attitudes of heads of households residing in the five county study area surrounding Green Bay. In initially designing the study in 1969 to focus on heads of households, it was reasoned that as taxpayers they have primary fiscal responsibility for solving environmental problems in the region and hence a greater stake than anyone else. Household heads were also studied exclusively in an effort to meaningfully delimit a study which could have focused on any one of several subgroups of the population. While the household heads study was underway, the Age of Majority bill was passed by the Wisconsin Legislature on March 22, 1972, making 18, 19 and 20 year olds legal adults with as much stake as other adults.

Subsequently, the study of heads of households with their mean age of 47 years old provided only a partial picture of Bay use, total water-based recreation participation, and environmental attitudes. To counterbalance the strong age influence on previous findings, a younger segment of the population would have to be surveyed. A greater proportion of participants, participation in a greater variety of activities and at greater rates might be expected among youth when compared to household heads. The attitudinal responses of young adults would be of particular interest to environmental policymakers as they may indicate trends emanating from a greater awareness of environmental problems and solutions.

To identify a random sample of young adults in the 18-25 age bracket would be most difficult due to the mobile nature of this population. Instead it was decided to study 16 and 17 year olds as a proxy for the young adults. This population can be identified as juniors and seniors in high school in the five county study area and an appropriate random sample drawn and probed. The interview schedule used previously with household heads would be modified to questionnaire format for use with the student sample.

The Green Bay Focus

The Bay of Green Bay is useful for probing the knowledge, perceptions and attitudes of adjacent populations because there are sharp contrasts in the Bay's water quality. These contrasts which have been documented with physical, chemical and biological data are reviewed for 3 Bay sectors by Ditton and Goodale on pages 11-20 in Sea Grant Technical Report 217. Whether or not high school juniors and seniors recognize these contrasts and reflect them in their perceptions of the Bay was basic to this study.

References

1. United States Senate, Committee on the Judiciary, Hearings before the Subcommittee on Constitutional Amendments of the Committee on the Judiciary relating to Prepared Constitutional Amendments Lowering the Voting Age to 18. 91st Cong., 2nd Session, 1970, pp. 544-545.

2. State of Wisconsin, An Act Relating to Lowering the Age of Majority from 21 Years of Age to 18 Years, Chapter 213, Laws of 1971, published March 22, 1972.

CHAPTER II

THE PRESENT STUDY

Objectives

The objectives of this research project are enumerated under three headings:

Recreation Participation

1. To identify and report participation in swimming, boating, fishing waterskiing, sailing, and duck hunting by juniors and seniors in high school within the five-county study area in Northeastern Wisconsin (Door, Kewaunee, Brown, Oconto, and Marinette Counties).
2. To determine the location of participation in water-based recreation activity on Green Bay and elsewhere.
3. To determine the extent of the respondents' use of three specific sectors of Green Bay (lower Bay, middle Bay, and upper Bay).
4. To evaluate the significance of variables pertinent to participation/nonparticipation in water recreation activities as well as participation/nonparticipation on the Bay.
5. To determine and evaluate the deterrents to further participation in the major water recreation activities (swimming, boating, and fishing) as reported by student respondents.

Water Quality Perception

1. To report generalized water quality evaluations and particular water quality parameters of concern to the respondents.
2. To establish relationships between recreation behavior patterns and water quality assessment wherever possible.

Local Participation, Perception and Attitudinal Data

1. To provide data from the regional sample regarding the Bay, water quality, condition changes and probable responses to change, willingness to allocate funds for water quality improvement as well as the source of those funds.
2. To provide summary data for the major political jurisdictions in the region to environmental educators and school officials, local and county officials, and planners and managers.

Application

In the refinement of the questionnaire from the interview schedule used previously, high priority was placed on gathering data of practical use to officials, decision makers and planners in the five-county area. Data gathered included, 1) the extent of recreation participation by juniors and seniors in high school in the study area, 2) the extent of water-based recreation activity at various generalized locations, 3) the location of water-based recreation activity on Green Bay, 4) ownership of recreation equipment by the individual student or his household, and 5) attitudes expressed by respondents that pertain to future recreational use of the Bay.

The data gathered in this study taken with previous data on heads of households provides comprehensive information useful in decision making for parks, recreation, and water quality improvement. This study of high school juniors and seniors should also provide a useful feedback to educators in the region who are involved with ecology or environmental education courses. By studying juniors and seniors it may be possible to predict changes in societal behavior, attitudes and perceptions that may be evolving. Also government officials and decision makers may have more information on the priorities of these future voters.

Data collected, as well as findings, will be available either partially or in entirety, to officials of the Wisconsin Department of Natural Resources, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, the Bay Lakes Regional Planning Commission, County Planning and Extension Offices, the University of Wisconsin-Green Bay, and Sea Grant Research and Advisory Services staffs.

The Study Area

The five Northeastern Wisconsin counties adjacent to the waters of Green Bay were included in the study area (Figure II-I). According to records provided by the Wisconsin State Department of Instruction, the 1972-73 population of juniors and seniors in high school in the five-county area was 10,560. Nearly two-thirds of that total, or 6,505 juniors and seniors resided in Brown County. Door County with 819 juniors and seniors was followed closely by Kewaunee County with 847 as the counties with the smallest populations of high school juniors and seniors. Both are rural counties which, according to 1970 census figures, continue to lose permanent residents.

It should be remembered that these population figures include only those students who attended school in the five-county area. While a vast number of 16, 17 and 18 year olds with residences elsewhere came to the study area, particularly during the summer, they were not included in the population figures nor were they sampled.

Table II-1 includes a population breakdown and data on selected characteristics of the population of the five-county area included in the study. The table also includes comparisons between the population and the sample on selected characteristics.

The Sample

During the late summer-fall of 1972, a complete listing of high schools in the study area and their enrollments of juniors and seniors was secured from public and private school authorities. This population data was corroborated using records provided by the Wisconsin Department of Public Instruction and the Catholic Diocese of Green Bay.

Based on the corroborated inventory, there were 10,560 juniors and seniors attending the 37 high schools, 32 public and 5 private, in the five-county area bordering the Bay of Green Bay. Thirteen public high schools were randomly selected with a predetermined minimum of two schools per county. In each of the three least populated counties with roughly equal junior and senior student populations, two high schools were selected. In Marinette County, with its slightly larger junior and senior student population, three schools were selected. A sample of 13 schools from Brown County alone would have been warranted if the sample was to be directly proportional to the population. To have fully represented Brown County students in the sample, however, would have overpowered the rest of the sample. Consequently, Brown County was underrepresented with six schools in the sample, while the rural counties of Door, Kewaunee, Marinette, and Oconto are overrepresented to adequately sample populations of all areas adjacent to the Bay (Table II-I).

At each of the 13 public high schools, a sample of 100 juniors and seniors was either randomly selected using class rosters or, in the case of the smaller schools with less than 100 upper classmen, every junior and senior present was given a questionnaire. In addition, 50 students from each of two private schools, which were segregated by sex were identified to complete the sample. The sample of 100 in each high school was composed of 25 junior females, 25 junior males, 25 senior females, and 25 senior males. The total number of questionnaires

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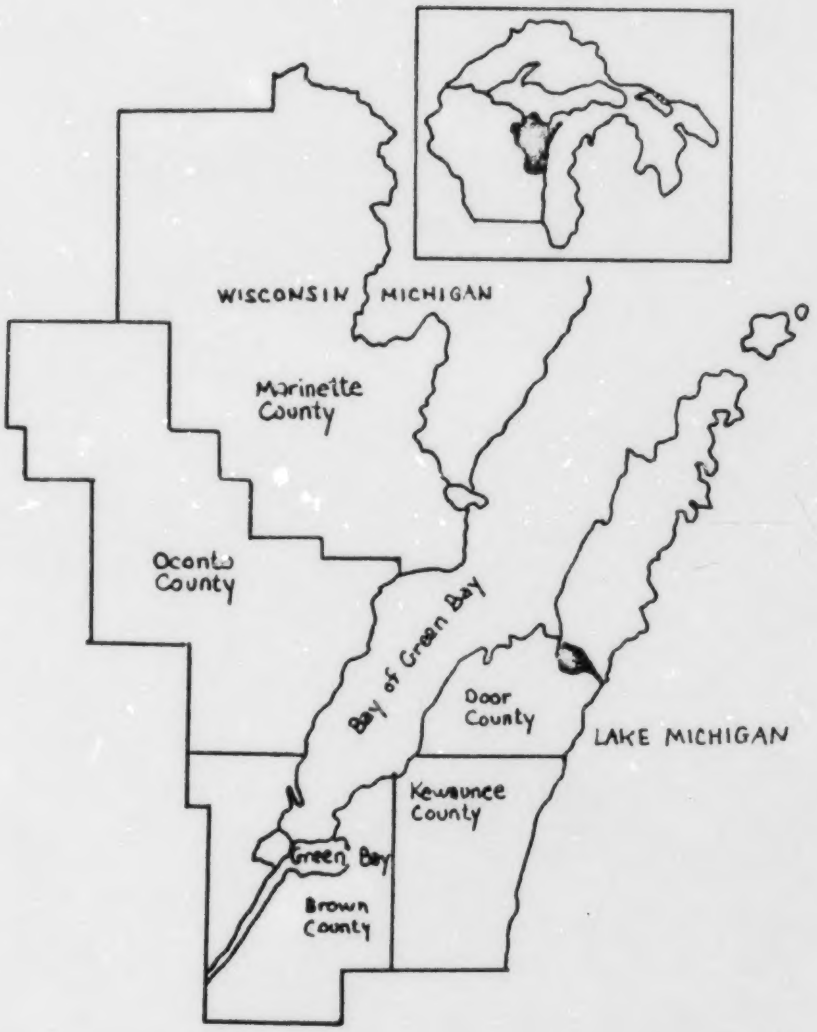

FIGURE II-1. GREEN BAY AND FIVE COUNTY STUDY AREA.

TABLE II-1

POPULATION AND SAMPLE CHARACTERISTICS BY COUNTY

	N	%	N	%	N	%	N	%	N	%	N	%	Outside 5 County Area	
Junior and Senior Population	10,560	100	6,505	61.6	819	7.8	847	8.0	1,471	13.9	918	8.7		
Sample	1,031	100	354	34.3	163	15.8	146	14.2	212	20.6	153	14.8	3	.3
Junior's School Population	5,408	100	3,332	61.2	437	8.1	435	8.0	752	13.4	452	8.4		
Juniors in Sample	512	100	176	49.7	82	50.3	69	47.3	111	52.4	72	47.1	2	66.7
Seniors in Population	5,152	100	3,173	61.6	382	7.4	412	8.0	719	14.0	466	9.0		
Seniors in Sample	519	100	178	50.3	81	49.7	77	52.7	101	47.6	81	52.9	1	33.3
Males in School Population	5,305	100	3,272	61.7	419	7.9	428	8.1	727	13.7	459	8.7		
Males in Sample	482	100	165	46.6	82	50.3	69	47.3	89	42.0	75	49.0	2	66.7
Females in School Population	5,255	100	3,233	61.5	390	7.4	419	8.0	744	14.2	459	8.7		
Females in Sample	549	100	189	53.4	81	49.7	77	52.7	123	58.0	78	51.0	1	33.3

administered was 1,329. The fact that the total initial sample did not total 1,400 students can be accounted for because all the schools selected did not have 100 juniors and seniors enrolled or present.

Table II-I includes three individuals in the sample who responded to the questionnaire at one of the schools in the five-county area but who reported residing outside the five-county area. Several plausible explanations exist for this unexpected extension of the sample. They include the possibility of students from Iron Mountain or Kingsford, Michigan attending Niagara High School, students from Shawano County attending Crivitz High School, or students from the Oneida Indian Reservation in Outagamie County attending Green Bay schools. Regardless of their origin, there are, nevertheless, 3 students of the 1,031 who completed questionnaires usable for analysis who resided outside the five-county study area.

The Questionnaire

An interview schedule previously used by Ditton and Goodale (1972) in their study of household heads in the five-county area was modified for use as a questionnaire with high school students. Information on the pretesting and consistency of response to questions in the earlier developed interview schedule is contained in the Ditton-Goodale report, pp. 55-57.[1] Since the questions were essentially the same as those asked previously, no further test-retest replications were undertaken in addition to those reported in the household heads report. The questionnaire was pretested using University of Wisconsin undergraduate students to insure that no unforeseen problems had arisen in the modification to questionnaire format.

While the numbering of questions in the questionnaire was identical to the earlier interview schedule to facilitate comparisons in response, several questions were not modified because they did not apply to high school students.

Questions dealing with permanent employment, marital status, and age of oldest child were subsequently deleted. Questions pertaining to the ownership of recreational equipment such as boats, waterskis, and snowmobiles were extended to include ownership by the household. Those questions put previously in open-ended fashion were again asked on the questionnaire and responses were coded later by University of Wisconsin student workers.

Field Work

The questionnaire was administered at each school by students from the University of Wisconsin-Green Bay. After the students received training in the administration of the instrument, they were dispatched to the schools previously selected when arrangements had been made for the administration of the questionnaire. Since schools varied considerably in their size, scheduling systems and format, there was no uniform way in which students were assembled for completing the questionnaire. Since students were assembled usually at the convenience of school authorities, several configurations occurred. These included: 1) all 100 students in one room for one period, 2) 4 groups of approximately 25 students for one period, 3) juniors and seniors separated in two different rooms for one period, and 4) men and women separated in two different rooms for one period.

Questionnaires were administered during a two-week period in early November, 1972. This time period was the earliest possible since school authorities had to be contacted at each school and arrangements for selecting and assembling students made. The time period was close enough to the summer when recreational activity among youth is high and recall among the students was still high. Had the questionnaire been administered any later in the school year, it would have conflicted with Thanksgiving vacation, or the very hectic period between Thanksgiving and Christmas holidays. As it was, the last week in which the questionnaire was administered occurred just prior to the opening

of deer hunting season in Wisconsin. Consequently, with many parents taking their children out of school to travel "up to the deer shack," there was absenteeism, particulary among males. To account for absenteeism at each school, at least five alternate students were randomly selected. At schools where there were not enough students to begin with, this procedure of selecting alternates was not followed for obvious reasons.

At each school, the administration of questionnaires was supervised by at least two university students. When the instrument had to be administered to 100 students at one time, extra personnel were assigned to answer questions, to provide assistance, and to supervise the group. Completed instruments were returned to the university student workers at the end of a 30-40 minute period.

After all the questionnaires were administered, they were carefully reviewed by university student workers for completeness. Several open-ended questions were coded during this process. Any instruments that were incomplete were eliminated from consideration. Since the respondents were a captive audience and refusal to participate was difficult, it is conceivable that those not wishing to cooperate left it incomplete. Refusals would, therefore, be included in the "Questionnaires completed but unusable for analysis because of missing data" category. A breakdown of questionnaires is as follows:

Total sample	1,400
Questionnaires not filled out because of absenteeism or lack of enrollment of juniors and seniors	-71
Number of questionnaires administered	1,329
Questionnaires completed but unusable for analysis because of missing data or failure to follow directions	-298
Questionnaires completed and usable for analysis	1,031

Excluding those questionnaires not filled out because of absenteeism or lack of sufficient enrollment, 1,329 students were surveyed. The summary of usable and unusable instruments is:

Completed and usable questionnaires	77.6%
Completed but unusable for analysis	22.4%
Questionnaires administered	100.0%

Analysis

Using summary data, responses were tabulated by county of residence in order to provide information in usable form for school and other officials. Summary tables for the five counties studied are presented in the Appendix A.

The second step in analyzing data in this study was to do cross tabulations and chi-square tests of significance between variables where differences were of interest. In addition to comparing single items, a reduced number of variables were selected for comparing subgroups of the population. Thus, for example, chi-square statistics were used to compare 1) participants with nonparticipants, 2) those who used Green Bay for water-based recreation with those whose activity took place on some other waterbody, 3) males with females, 4) juniors with seniors, 5) students from boat-owning households with students from nonboat-owning households, 6) comparisons by primary activity, and 7) by primary location of activity.

It should be pointed out that while participation frequency data was gathered for swimming, boating, fishing, waterskiing, sailing, and duck-hunting, considerably more data was gathered on swimming, boating, and fishing.

CHAPTER III

THE FINDINGS DESCRIBED

Characteristics of the Respondents

Of the 1031 respondents who completed usable instruments, they were nearly equally divided between juniors and seniors in high schools, and between males and females. The mean age was 16.7 years. The distribution of these characteristics are shown in Table III-1.

The vast majority of respondents reported living in the five-county area their entire lives. Only 17.8% reported living in the area less than 10 years. This can be interpreted to mean that the study is dealing with a stable group of students who have had ample time to familiarize themselves with the region and its resources. The relative familiarity with the region is further supported by the fact that nearly 20% of the sample indicated that their family owned a camp or cottage for seasonal use.

There were county differences in reported camp or cottage ownership. In Brown County, the most populous and urban county, 26.3% of the respondents reported that their households owned a camp or cottage, while in Kewaunee County the figure was 12.3%. The percents for the remaining three counties were: Door (15.3), Marinette (16.5), and Oconto (17.7). Approximately two-thirds of the cottages were located in either Door, Marinette or Oconto Counties, generally regarded as recreation or vacation areas with dramatic seasonal increases in population.

Since the study focused on high school students, selected questions which would be appropriate for the total population were not included. These were questions regarding occupation, income, and size of family. A complete description of demographic characteristics for the total population of the five-county

TABLE III-1

SAMPLE CHARACTERISTICS - YEAR IN SCHOOL, SEX, AGE: PERCENTS

Year in School		Sex		Age				
Jr.	Sr.	M	F	<16	16	17	18	19+
49.7	50.3	46.8	53.2	.9	39.9	51.2	7.1	1.0

area is included in a previous report.[1]

Thirty percent of the sample reported working full time during the previous summer. It would appear that these students had less time to engage in water recreation than the nonworking students but most likely would have the means to participate in water activities that required some expenditure for equipment. Individuals living in vacation areas (Door, Marinette, and Oconto Counties) where summer populations increase dramatically were more likely than residents from Brown and Kewaunee Counties to have summer employment. For instance, 57.1% of Door County students reported full-time summer employment compared to 20.9% of Brown County students who worked.

Twenty-three percent of the student respondents were members of households owning one car and 44.3% were members of two-car households. While 32.5% of the respondents were members of three car or more households, it is likely that they responded to this question literally rather than in terms of usable vehicles for passenger transportation. Findings are useful, however, in highlighting the fact that the respondents potentially had transportation at their disposal. County differences in car ownership were negligible.

Ownership of recreational equipment used in water-related activity is summarized below. More precise ownership data, including breakdown by county and the exact number of items owned is available from the authors.[2]

Boat(s)	41.5%	of the households owned one or more
Waterskis (single or pair/s)	20.8	" " " " " " "
Snowmobile(s)	38.2	" " " " " " "
Camping Trailer(s)	20.9	" " " " " " "

The three counties with the greatest inland water surface acreage with

TABLE III-2
Fishing, Boating, and Swimming
Participants- Participants Using the Bay of Green Bay and Participants Using the Bay Primarily: Numbers and Percents

	Fishing			Boating			Swimming		
	Number	% of all Respondents (1031)	% of Fishermen (641)	Number	% of all Respondents (1031)	% of Boaters (718)	Number	% of all Respondents (1031)	% of Swimmers (949)
Total Sample	1031	100		1031	100		1031	100	
Participants									
Did not participate during past 12 months	390	37.8		313	30.4		82	8.0	
Did participate (1 or more times) during past 12 months	641	62.2	100	718	69.6	100	949	92.0	100
Bay Users									
Did not use the Bay	450	43.7	70.2	430	41.7	59.9	641	62.1	67.6
Dis use the Bay	191	18.5	29.8	288	27.9	40.1	308	29.9	32.4
Use Bay Primarily									
Did not use Bay as primary location	564	54.7	88.0	560	54.3	78.0	834	78.8	87.9
Dis use Bay as primary location	77	7.5	12.0	158	15.3	22.0	115	11.2	12.1

TABLE III-3
Sailing, Waterskiing, and Duck hunting
Participants -Participants Using the Bay of Green Bay, and Participants Using the Bay Primarily: Number and Percents

	Sailing			Waterskiing			Duckhunting		
	Number	% of all Respondents (1031)	% of Sailors (222)	Number	% of all Respondents (1031)	% of Waterskiers (387)	Number	% of all Respondents (1031)	% of Duckhunters (173)
Total Sample	1031	100		1031	100		1031	100	
Participants									
Did not participate during past 12 months	809	78.6		643	62.4		858	83.2	
Did participate (1 or more times) during past 12 months	222	21.4	100	387	37.6	100	173	16.8	100
Bay Users									
Did not use the Bay	118	10.8	50.9	234	22.8	60.5	116	11.3	67.1
Did use the Bay	109	10.6	49.1	153	14.8	39.5	57	5.5	32.9
Use Bay Primarily									
Did not use Bay as primary location	146	14.3	65.8	285	27.7	73.7	136	13.2	78.6
Did use Bay as Primary location	76	7.3	34.2	102	9.9	26.3	37	3.6	21.4

public access (excluding Green Bay and Lake Michigan) also have the greatest percentage of household ownership of one or more boats. Oconto (52.3), Door (49.1), Marinette (44.3) were followed by Brown County (37.8) and Kewaunee County (27.4).

A higher proportion of respondents reported owning water-related recreation equipment than would be predicted for a random sample of the total population in the study area. For example, data collected indicates waterskis are owned by one of five respondent households. This probably does not represent the ownership pattern of the total population since, by definition, it is overrepresentative of household units containing high school students.

Participation in Recreational Activities

Juniors and seniors in the study area were asked to indicate the number of times they had participated in any of six water-based activities during the previous twelve months. The activities on which data was collected include: swimming, fishing, boating, waterskiing, sailing, and duck hunting. Of the 1031 respondents, 989 or 95.8% reported participation one or more times during the previous year in at least one of these six activities. Results indicated that the largest proportion of the sample engaged in swimming, followed by boating, fishing, waterskiing, sailing, and duck hunting (Tables III-2, III-3).

For the most popular activities (swimming, boating, and fishing) 987, or 95.8% of the sample indicated participation in any one of these three activities. Since the total number of participants in any of the six activities (989) can nearly be accounted for by the number of participants in the three major activities (987), it appears that among participants in the three minor activities all but two also participated in one of the three major activities. An analysis of findings of each of the six activities in order of popularity follows. It

should be remembered that popularity was measured in terms of the proportion of the sample who participated, rather than in terms of frequency of participation.

Swimming

An overwhelming majority of the sample, 92%, indicated participation in swimming during the previous twelve months. Since the frequencies of participation were coded and grouped in categories, exact participation rates for the sample could not be determined. However, using the midpoint of each category as the value representative of that category, approximations of participation rates were calculated. In this way it was determined that for the entire sample, the average number of swimming occasions per person was 27.2 during the previous twelve months. The mean among swimmers was 29.6 swimming occasions. The fact that the two figures are nearly identical is due to the high proportion of swimming participants (92%) in the sample.

The proportion of swimmers in each county can be ranked as follows: Oconto County (97.4%), Brown (94.6%), Marinette (94.3%), Door (92.6%) and Kewaunee County (77.0%). Those who engage in swimming most frequently, that is, more than 50 times during the previous twelve months were more likely to reside in Door and Marinette Counties.

The Bay of Green Bay was not the primary location for swimming. One of three swimmers (32.4%) used the Bay at least once while one in eight (12.1%), used it as their primary swimming location.

Those who reported swimming the Bay at least once during the previous twelve months were divided nearly equally between the three sectors of the Bay (Table III-4 and Figure III-1).

The most popular swimming area for the students in the sample was inland lakes. Of the total sample, 66.3% reported swimming in inland lakes at least

once during the previous year. This was followed closely by pools (60.5%), a finding perhaps explained by the presence of pools and swimming programs in many schools. The other locations had been used by a nearly equal percentage of the sample. These were: streams and rivers (34.9%), Lake Michigan (30.2%), and Green Bay (29.9%).

Thirty-eight percent of swimmers used inland lakes more frequently than any other location. This was more than for any other location. Pools was the second swimming location used most frequently, followed by streams and rivers, Green Bay, and finally Lake Michigan (Table III-5).

Boating

Of the total sample of 1031 students, 69.6% reported boating participation at least once during the past twelve months. Using the procedure previously described to calculate an approximate mean, it was determined that the mean number of boating occasions was 9.8 times per person during the past twelve months over the entire sample. Among boaters, the mean was 14.2 boating occasions during the same period.

The proportion of student boaters in each county can be ranked as follows: Oconto County (77.1%), Brown (76.0%), Door (73.6%), Marinette (60.8%), and Kewaunee County (50.7%).

The Bay was not the primary location chosen by boaters. Two in five (40.1%) of boaters used the Bay at least once while only one in five (22.0%) used it as their primary location.

Those who reported boating on the Bay at least once during the past year were divided nearly equally between the three sectors of the Bay (Table III-4 and Figure III-1).

Inland lakes were by far the most popular boating location in that 44.0% of the entire sample reported boating at least once at an inland lake location.

Other areas were used by a substantially lower proportion of the sample. These were: Green Bay (27.9%), streams and rivers (26.9%), and Lake Michigan (18.0%). The fact that a greater proportion of the sample utilized inland lakes for boating might be explained by the lack of suitably navigable streams and rivers or the comparatively greater cost involved in Great Lakes boating.

Among boaters, 339 of 718 or 47.2% reported using inland lakes more than any other location. A smaller proportion used Green Bay as their primary boating

location (22.0%), followed by 18.7% for streams and rivers and 12.3% for Lake Michigan (Table III-5).

Fishing

Participation in the third most popular activity, fishing, was reported by 62.2% of the respondents. For the total sample, the mean number of fishing occasions per person was 10.1 times during the previous twelve months. Among fishermen the mean was 16.2 times during the same period.

The proportion of fishing participants in each county can be ranked as follows: Oconto County (71.2%), Door (64.4%), Marinette (61.8%), Brown (60.4%), and Kewaunee County (54.1%).

While three in ten students participating in fishing (29.8%) used the Bay one or more times during the past twelve months, only one in eight (12.0%) used the Bay more often than any other water body.

Those who reported fishing on the Bay at least once during the past twelve months tended to use the middle or northern sectors of the Bay. In fact, 77.7% of Bay fishermen used one of these sectors. These are areas where sport fishing is most likely to be successful and where public access facilities are most available (Table III-4 and Figure III-1).

Streams and rivers was the most popular location for fishing. Nearly half of the respondents (46.4%) reported the use of streams and rivers one or more times during the previous twelve months. This was followed closely by inland lakes where 39.5% of the sample had fished at least once. A substantially lower proportion of the respondents reported fishing at least once on Lake Michigan or Green Bay (21.2% and 18.5%, respectively). The low proportion of Lake Michigan and Green Bay fishermen may be influenced in part by a

TABLE III-4

BAY LOCATION USED MOST FREQUENTLY -
FISHING, BOATING, SWIMMING: NUMBER AND PERCENTS

Sector	Fishing		Boating		Swimming	
	N	%	N	%	N	%
Lower Bay	44	22.3	101	34.8	99	30.1
Middle Bay	80	40.6	95	32.8	116	35.3
Upper Bay	73	37.1	94	32.4	114	34.7
TOTAL	197	100.0	290	100.0	329	100.1

NOTE: Data on Bay location used most frequently was only gathered for fishing, boating, and swimming.

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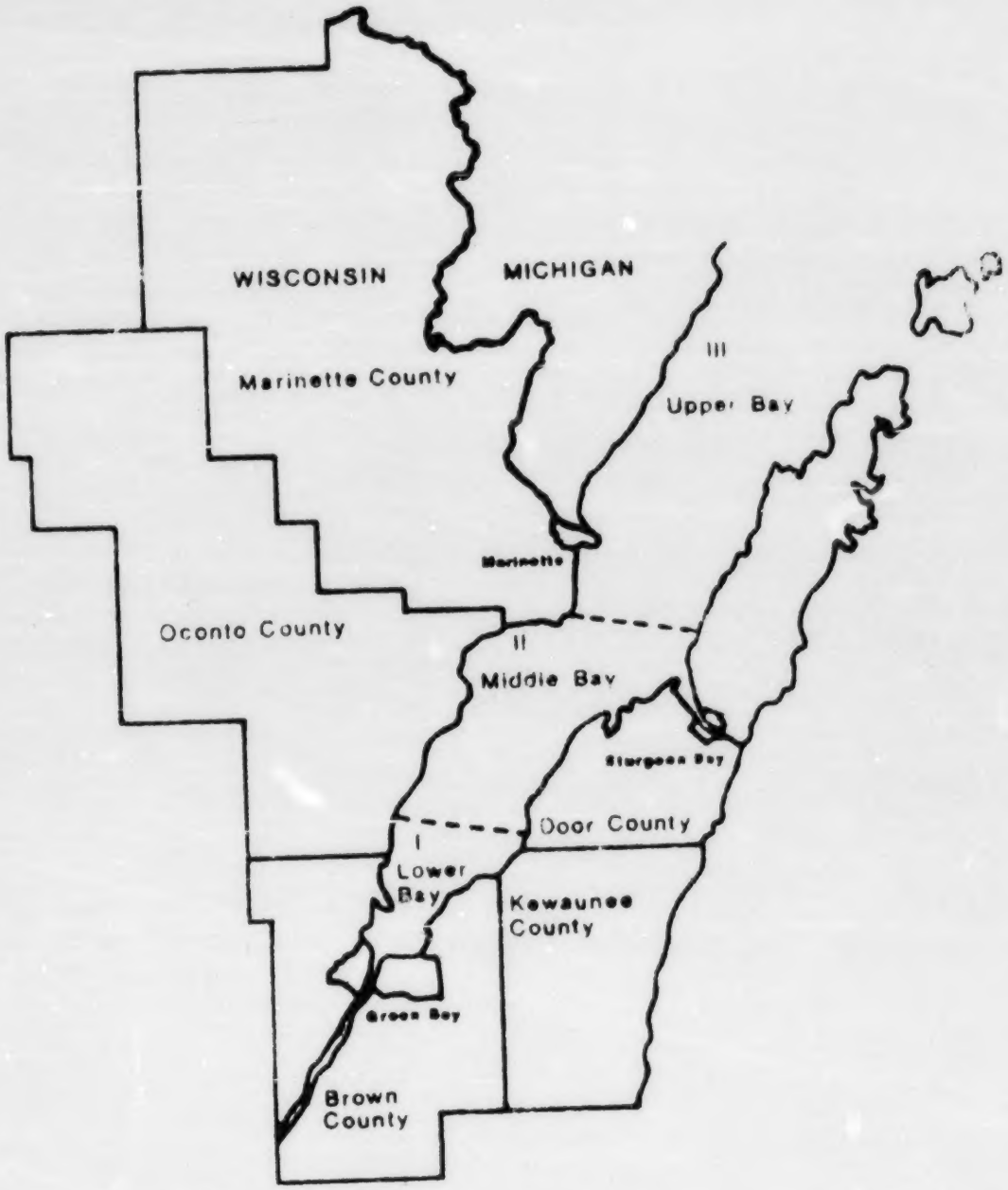

FIGURE III-1. GREEN BAY RECREATION USE SECTORS.

relatively low probability of success and high cost of fishing on these water bodies.

Among fishermen, 41.5% reported using streams and rivers more than any other location. This was followed closely by inland lakes, Lake Michigan and Green Bay (Table III-5).

Waterskiing

Nearly four in ten respondents (37.6%) reported having waterskied one or more times during the past twelve months. For the entire sample there was an average of 4.7 waterskiing occasions per person during the previous year, and among waterskiers the mean was 12.4 occasions.

The proportion of waterskiing participants in each county can be ranked as follows: Brown County (48.3%), Door (47.2%), Oconto (32.7%), Marinette (32.1%), and Kewaunee County (14.4%). The greatest frequency of participation among waterskiers occurs in Door County where 20.3% of waterskiers reported having participated on 13 or more occasions during the previous year.

While two of five (39.5%) waterskiers in the sample used the Bay at least once, only one in four (26.4%) used the Bay more frequently than any other location.

Among all locations, inland lakes were used for waterskiing by the greatest proportion of the total sample. One-fourth (24.7%) of the sample reported having used inland lakes for waterskiing at least once in the previous year. This was followed by Green Bay (14.8%), streams and rivers (7.2%), and Lake Michigan (6.1%). The latter two locations might not have been widely viewed as having potential for safe waterskiing.

Among the 387 individuals who had participated in waterskiing during the previous twelve months, 55.8% reported using inland lakes more than any other location for their activity. Green Bay was used most frequently by 26.4%

of the waterskiers, followed by streams and rivers (10.7%), and Lake Michigan (7.0%) (Table III-5).

Sailing

One-fifth of the sample (21.4%) reported having sailed at least once during the past twelve months. For the total sample, the mean number of sailing occasions was 1.8, while among sailors the mean was 8.6 sailing outings.

The proportion of sailing participants in each county can be ranked as follows: Door County (44.2%), Brown (23.2%), Kewaunee (19.2%), Marinette (12.3%), and Oconto County (8.5%). As with waterskiing, Door County students also show the highest frequency of participation in sailing with 15.3% having sailed 13 or more times during the previous twelve months. This is considerably more intense participation than for the total sample where the comparable figure is 3.9% reporting 13 or more sailing occasions during the year.

Among all activity groups, sailors were most likely to have used the Bay. Half of the sailing participants (49.1%) used the Bay at least once and one-third (34.2%) reported using the Bay more than any other location.

Green Bay and inland lakes were used for sailing by a slightly greater proportion of the total sample than the other two locations. Approximately ten percent of the total sample reported having sailed on Green Bay or inland lakes (10.6% and 10.2%, respectively). The other locations, Lake Michigan and streams and rivers, received use by a lesser proportion of the total sample (5.9% and 3.5%, respectively).

Among 222 sailing participants, 38.3% reported using inland lakes most frequently, followed by Green Bay (34.2%), Lake Michigan (18.9%), and streams and rivers (8.6%) (Table III-5).

Duck Hunting

Duck hunting had the lowest proportion of participants with only 16.8% of the total sample reporting participation in this activity one or more times during the previous twelve months. For the total sample the mean number of hunting occasions was 2.4 times during the previous year, while for duck hunters the mean was 14.6 times during the year.

The proportion of duck hunting participants in the sample in each of the counties can be ranked as follows: Door County (20.9%), Marinette (18.4%), Oconto (17.6%), Brown (14.4%), and Kewaunee County (13.0%).

One in three duck hunters (32.9%) used the Bay one or more times, while only one in five (21.4%) used the Bay more often than any other body of water.

Inland lakes and streams and rivers were used for duck hunting by a higher proportion of the total sample than the other two locations. Inland lakes were reportedly used by 10.9% of the sample, followed by streams and rivers (10.8%), Green Bay (5.5%), and Lake Michigan (3.1%).

Of the 173 duck hunting participants, streams and rivers was cited as the location used most frequently by a plurality of duck hunters (41.5%). Other primary locations were cited by a small number of duck hunters: inland lakes (31.2%), Green Bay (21.4%), and Lake Michigan (5.8%) (Table III-5).

Participation Deterrents

For boating, fishing, and swimming, the respondents were asked a series of three questions. These were:(1) Those who did not participate were asked to state the major reason why they did not. (2) All respondents were asked if they would like to participate in each activity more frequently, and (3) Those indicating a desire to do more were asked the reason for not doing so.

While there are a variety of reasons why a respondent did not participate or desire to participate in activities, many of the reasons are activity specific. The list of reasons for not participating varies by activity. From an inspection of the alternatives available in the questionnaire (Appendix A), it should be clear that the alternative "not enough time" was not available to the respondents. Of those who would have indicated time restraints, the problem was not a lack of discretionary time, but the relative priorities given other alternative uses of the available time. Thus, it wasn't a lack of time which prevented participation in water recreation, but a decision to devote what time was available to other pursuits and responsibilities. If, during the administration of the questionnaire, one of the student respondents noted that the lack of time alternative was not available to choose, he/she was instructed to indicate the next best alternative.

Swimming

Of the 89 individuals who did not participate in swimming during the previous twelve months, one-half reported the reason was that they did not know how to swim. Of those indicating that they did not know how to swim, more than half were from Kewaunee County. This large proportion can be accounted for by the fact that neither of the two schools sampled in the county had a pool or swimming program. The reasons of distance to travel, dirty water, or crowded facilities were cited by only 15 of the non-participants and apparently do not serve as major deterrents to swimming among students.

When questioned whether they would like to have gone swimming more often during the previous year, 73.5% said yes. These respondents were then asked why they did not do so, and a variety of reasons were chosen. "Cold water" was cited by 15.9%, "distance to travel" was indicated by 15.3%, followed by

"crowded facilities" (13.0%), "not a good swimmer" (9.6%), "Family and friends not interested" (9.1%), "water is dirty" (9.1%), and finally, "poor health" (1.4%).

Boating

Of the 34% of the sample who did not participate in pleasure boating during the previous twelve months, the vast majority indicated they did not do so because they did not have access to a boat. Another reason cited often was "not interested." When these two reasons are combined, 326 of the 352 nonboaters are accounted for.

When asked whether they would like to have gone boating more often during the last year, 76.1% said yes. These respondents were then asked why they did not do so, and the lack of a boat was cited as the reason by nearly two-thirds. Of the 45 individuals who cited "places are too crowded" as the reason they did not boat more, 14 came from Door County, a county with heavy seasonal use by many nonresidents.

Fishing

Of the total sample of 1031 respondents, 399 indicated that they did not go fishing during the previous twelve months. The most common reason, as cited by 265 students, was lack of interest in fishing. When the total sample was asked if they would liked to have gone fishing more during the previous year, 53.8% said yes, and the majority of these individuals cited one of three reasons: "no boat," "never catch anything," and "not interested."

Considering all three activities, the respondents generally wanted to participate more, and commonly gave a lack of equipment ownership as the reason for not doing so. Perhaps what is important is that only a small proportion of the total sample cited environmentally related deterrents such as "never catch anything," "water is too dirty," and "good places are too crowded." It appears that the ability to swim or the ownership of a boat is a prerequisite for their consideration of some of the other potential deterrents to participation. The student who wants to boat, it would appear, first has to establish if a boat is available, and if it is, then can consider other deterrents to boating such as crowded facilities or dirty water.

Locations Used Most Frequently

Since responuents were asked to indicate the number of times they participated in water activities by location, it was possible to compare locations for all acitivities or for each activity and to rank water resource areas across all activities. Findings indicate that among boaters, waterskiers, and swimmers, inland lakes were twice as popular as other water locations, and was cited as the location used most frequently by participants in four of the six activities studied. For fishing and duck hunting, streams and rivers was the preferred location, with inland lakes a close second in both cases (Table III-5). While Green Bay was not the primary location for any of the six activities, it was the second most used location for boating, waterskiing, and sailing. For all acitivities taken together, however, preferred locations would rank as follows: (1) inland lakes, (2) streams and rivers, (3) Green Bay, and (4) Lake Michigan. It would not appear that Green Bay and Lake Michigan, regardless of their size, accessibility and recreation potential do not rank high as water-based recreation

TABLE III-5

LOCATION USED MOST FREQUENTLY--SWIMMING, FISHING, BOATING, WATERSKIING, SAILING, DUCK HUNTING: NUMBER AND PERCENTS

	Swimming		Fishing		Boating		Waterskiing		Sailing		Duck Hunting	
	N	%	N	%	N	%	N	%	N	%	N	%
Inland Lakes	356	37.6	208	32.4	339	47.2	216	55.8	85	38.3	54	31.2
Green Bay	115	12.1	77	12.0	158	22.0	102	26.4	76	34.2	37	21.4
Streams and Rivers	134	14.1	266	41.5	134	18.7	42	10.7	19	8.6	72	41.5
Elsewhere Lake Michigan	68	7.2	90	14.0	87	12.3	27	7.0	42	18.9	10	5.8
Pools	276	29.1	--	--	--	--	--	--	--	--	--	--
Total	949	100.1	641	99.9	718	100.2	387	99.9	222	100.0	173	99.9

resources among student respondents residing in the study area.

The fact that inland lakes serve as the primary location for a larger number of participants than any other location does not necessarily imply that this location is preferred over all others but simply that inland lakes are more frequently used. In order to establish and understand preference more fully, it is necessary to probe the reasons why students participated at the location they use most frequently. This information is summarized for fishing, boating and swimming in Table III-6.

The following ranking of reasons as reported by each activity group is useful for comparative purposes:

(Ranked from most often cited reason for area selection to least often cited reason)

Swimming	Fishing	Boating
proximity	proximity	proximity
clean water	success	clean water
not crowded	not crowded	pretty spot
warm water	clean water	not crowded
pretty spot	pretty spot	friendly people
good facilities	good facilities	good facilities
not too expensive		

For all three activities proximity was the most frequently reported reason for selecting primary location. If it can be assumed that students are less mobile than the rest of the population, it would be expected that proximity would be the major location determinant of their recreation acitivity. "Clean water" was the next most frequently cited reason by swimmers and boaters, while fishermen were concerned with their "success" which may be a function of water quality. Also of interest is the infrequent citing of good facilities as a reason for selecting the primary location of their activity. This may not indicate a lack of concern for the quality of facilities but rather may be a response to an

TABLE III-6

REASONS FOR SELECTING AREAS USED MOST FREQUENTLY--
SWIMMING, FISHING, BOATING: PERCENTS

	Close By	Cleaner Water	Not too Crowded	Pretty Spot	Good Facili-ties	Catch More	Friendly People	Water Warmer	Not too Expen-sive	Totals
Most Swimming										
Green Bay	44.3	17.7	19.5	8.0	1.8	--	--	8.0	.9	100.2
Lake Michigan	27.1	28.6	17.4	7.9	4.7	--	--	14.3	0.0	100.0
Inland Lakes	27.2	36.7	12.3	5.3	6.4	--	--	10.4	1.7	100.0
Streams & Rivers	44.5	17.0	17.7	9.2	3.9	--	--	6.9	.8	100.0
Pools	31.1	27.5	11.2	6.6	9.1	--	--	12.6	1.8	100.1
Most Fishing										
Green Bay	44.7	5.3	14.7	5.3	2.7	29.3	--	--	--	100.0
Lake Michigan	33.7	12.4	14.6	6.7	4.5	28.1	--	--	--	100.0
Inland Lakes	26.2	14.6	14.6	14.1	1.0	29.6	--	--	--	100.1
Streams & Rivers	30.0	13.0	16.3	8.8	1.9	30.0	--	--	--	100.0
Most Boating										
Green Bay	43.1	14.4	13.8	9.2	9.2	--	10.5	--	--	100.2
Lake Michigan	30.7	25.0	12.5	20.5	7.9	--	3.4	--	--	100.0
Inland Lakes	22.0	30.7	14.1	18.7	5.9	--	8.6	--	--	100.0
Streams & Rivers	41.2	15.5	11.7	19.9	5.1	--	6.6	--	--	100.0

abundance of good facilities in the region to a point where the decision is made on the basis of other parameters.

By comparing users of one location with another, a few patterns cut across all activity groups. Those who use Green Bay as their primary location do so because of their close proximity to the Bay. The same is true for streams and rivers, and to some extent Lake Michigan. Inland lakes, the most frequently cited primary location, provides a contrast here. This location was not chosen primarily because of proximity but rather because of clean water and in the case of fishing, success.

Bay Use Location Determinants

All respondents were asked to indicate the most important factor to be considered in making a decision as to where to go for water-based recreation on Green Bay. Respondents could choose from among four alternatives, each representing some dimension of site attraction. Of the four alternatives, "good facilities" was picked as the most important determinant by 49.8% of the sample. Lack of crowding and proximity were indicated as most important by 23.8% and 22.1% respectively. Concern for personal expense was not an important determinant as only 4.4% pointed to it.

It is surprising that the youthful sample with its limited mobility and finances did not indicate accessibility or cost as important considerations. Instead, the quality of the facility seems more important to the individuals in determining recreation location. It should be remembered that these determinants pertain to location decisions relative to Green Bay. This question was answered by all respondents, whether or not they had used the Bay. The reasons cited for use of a Bay location vary considerably from the determinants for the locations

used most frequently. This may reflect the fact that inland lakes and not the Bay was the location used most frequently across all water activities.

Choosing location determinants for recreational use is in part influenced by the degree to which these determinants are satisfied by local facilities. If there are abundant facilities nearby, it would follow that the access dimension would become less salient and considerations of quality would increase in importance. For example, Door County students who already enjoy an abundance of good nearby facilities on the Bay, considered the quality of the facilities to be less important than did the total sample. They were also more concerned with the degree of crowding of areas than students from any other county. This may be a reflection of the high levels of seasonal use of the county's resources.

Description of Green Bay Waters

Respondents were asked to generally describe the waters of the Bay of Green Bay. Of the 1031 respondents, 57% indicated that the Bay was "dirty" and 19% indicated that the Bay was "somewhat dirty." Alternately, 4% responded that the Bay was "clean" and 7% that it was "somewhat clean." The remainder volunteered that quality "depends on location" (5%), or "don't know" (8%).

It should be remembered that this question alone was phrased in an open-ended fashion and responses were later categorized. The "don't know" response could be a result of a convenient alternative of the students' own choosing rather than lack of information. However, in some of the cases where schools sampled were some distance from the Bay, the "don't know" alternative may have been chosen because of an actual lack of knowledge.

The fact that th distinct water quality contrasts by area of the Bay appears to have been ized by only the 5% who indicated that water

TABLE III-7

DESCRIPTION OF GREEN BAY WATERS BY PLACE OF RESIDENCE:
NUMBER AND PERCENTS

	N	Clean %	Reason-ably %	Somewhat Dirty %	Dirty %	Depends on Location %	Other %	Don't Know %
Total Sample	1031	4.1	7.3	19.2	56.9	4.6	.5	7.5
Brown County	354	2.8	6.8	17.0	65.0	6.2	.9	1.4
Door County	163	6.8	14.1	30.1	38.7	9.2	0.0	1.2
Kewaunee County	146	4.1	2.1	21.2	61.6	2.1	0.0	8.9
Marinette County	212	5.7	6.6	13.7	51.4	2.4	.5	19.8
Oconto County	153	2.0	7.2	19.0	60.1	1.3	.7	9.8
Outside Five-County Area	3	0.0	0.0	0.0	100.0	0.0	0.0	0.0

Note: The "Other" category was used for responses of "Green." Instead of project staff interpreting this response in terms of the clean-dirty continuum, it was assigned to the "other" category. With an interview medium, responses such as "green" could have been probed further by the interviewer prior to classification. Use of a questionnaire rules out such probing.

quality "depends on location." The overwhelming majority of respondents seemed to generalize the Bay water quality near their place of residence to the entire Bay. Among Door County students, 39% indicated that the Bay was "dirty." This was followed by 51% for Marinette County, 60% for Oconto County, 62% for Kewaunee County, and 65% for Brown County students. Taken with the fact that the lower sector of the Bay is seriously degraded and the waters of the upper sector are of high quality there is support for the assertion that the perceptions of local conditions were generalized to the entire Bay. The breakdown of these data by county is found in Table III-7.

Since the terms "dirty" or "clean" may connote a variety of things, it was necessary to gain a more precise understanding of which characteristics of water were considered in making judgments of water quality. As a result, two questions dealing with more specific water quality characteristics were included in the instrument. From two arrays of responses, each student indicated in one case which water characteristic was most bothersome to Bay users, and in the other, the one characteristic he/she disliked most about the Bay. The two lists and the percent indicating each alternative are as follows:

	%		%
Water too cold	9.6	Water is cloudy	8.5
Unpleasant smell	37.7	Chemicals	9.0
Winds	1.4	Harmful bacteria	8.1
Waves	3.1	Suds, film or foam on water	28.4
Junk on bottom	33.8		
Too many weeds	14.5	Dead fish	46.0
	100.1		100.0

Taking both lists into account, Bay water quality characteristics of greatest concern to the students were dead fish, unpleasant smell, and "junk on

the bottom". It is noteworthy that water temperature, wind, and waves are not recognized as first order concerns even though these characteristics may be potential hazards to personal safety. Equally, characteristics such as chemicals and harmful bacteria, long the concern of public health officials in evaluating the suitability of water for recreation are also not cited frequently by the present sample.

There were few county differences in the degree to which each of these characteristics are disliked or viewed as bothersome. Door County students were more bothered by cold water than any other group, less bothered by unpleasant smell and chemicals in the water. This might be explained by the fact that water quality is generally high in this area.

Funds for Water Quality Improvement

Respondents were asked to indicate the degree to which they wanted to see changes in the amount of federal expenditures for improvement of water quality. In a period of dissatisfaction with taxes, increasing governmental costs, and concerns about reordering of national priorities, questions concerning federal expenditures are likely to trigger these concerns. It is possible that people will respond conservatively in order to avoid having their response taken as a mandate for increased taxation. The present school-age sample, the majority of whom is not of tax-paying age, can, therefore, be expected to be more generous than the total population.

On a seven point scale (from "decrease a lot" to "increase a lot"), the vast majority, 92.5%, of students favored an increase in these expenditures. Only 5.6% wanted the expenditures maintained at present levels, and 2% wanted this decreased. For purposes of presentation the seven categories have been

collapsed to five and shown below:

Decrease	2.0%	(n=20)
Maintain	5.6	(n=58)
Increase a little	25.6	(n=264)
Increase quite a bit	39.6	(n=408)
Increase a lot	27.3	(n=281)
	100.1	(n=1031)

Brown County students were most apt to favor an increase in expenditures (96.9%) and Marinette County students were least willing (88.3%). This difference may be related to differences in local water quality that are known and understood by the students.

Following this question, respondents were faced with the following hypothetical question: "If more were to be spent on improving water quality without raising taxes, the money would have to be taken from some other government program. Which of these programs would you take the money from? (Choose one.)" They were then presented with a list of eight federal program areas. The programs and the percentage and number of respondents for each are shown below:

	%	N
Education	1.4	14
Transportation	4.3	44
Defense	17.1	176
Health	2.3	24
International Aid	17.0	175
Space	52.3	539
Agriculture	1.7	18
Community Development	4.0	41
	100.1	1031

It is clear that the student population sees the space program as the potentially largest contributor of funds. It should be remembered, however, the survey was conducted during a time when there was little media coverage of space missions and hence a low level of awareness of the program and its objectives. Seven-eighths of the respondents indicated that the monies should come from either Space, Defense or International Aid program areas.

Brown County students were most likely to identify Defense and International Aid as sources of increased funding and least likely to cite Space expenditures than any other group. Oconto County students were least likely to cut Defense and most likely to cut Space.

Water Condition Changes and Responses

Participants in the three major activities, swimming, fishing, and boating were asked a series of questions regarding (1) How have water conditions changed at the place you swim (fish, boat) most frequently since you started swimming (fishing, boating) there? (2) What would you do if conditions deteriorated there?, and (3) Do you think you'll have to make that decision soon? These questions were posed in reference to the location used most frequently for each of the three activities by each respondent. Findings are presented in Tables III-8, III-9 and III-10.

The purpose of these questions was to determine the respondents' perceptions of changes in water quality and how these perceptions might lead to modifications in water-based recreation behavior. A secondary purpose was to probe the students' optimism or pessimism regarding the likelihood of having to modify their behavior in response to the deterioration of water quality. Several cautions are appropriate. It should be remembered that perceptions of water quality may be unrelated to water quality conditions as physically monitored. Also, responses

TABLE III-8

CONDITION CHANGE AT THE AREA USED MOST FREQUENTLY--
SWIMMING, FISHING, BOATING: PERCENTS

	No Change %	Better %	Worse %	Total %
Swimming				
Green Bay	39.8	10.6	49.6	100.0
Lake Michigan	58.6	3.2	38.2	100.0
Inland Lakes	61.3	8.3	30.3	99.9
Streams & Rivers	52.3	16.2	31.5	100.0
Pools	61.9	8.3	29.7	99.9
Fishing				
Green Bay	48.0	2.7	49.3	100.0
Lake Michigan	55.1	9.0	36.0	100.0
Inland Lakes	54.4	8.7	36.9	100.0
Streams & Rivers	60.3	8.3	31.6	100.2
Boating				
Green Bay	41.8	10.5	47.7	100.0
Lake Michigan	46.6	13.6	39.8	100.0
Inland Lakes	52.2	9.2	35.7	100.1
Streams & Rivers	55.1	11.7	33.1	99.9

TABLE III-9

RESPONSE IF WATER CONDITIONS DETERIORATED AT AREA USED MOST FREQUENTLY--
SWIMMING, FISHING, BOATING: PERCENTS

	Would Not Bother Me %	Stay in Same Location But Participate Less Frequently %	Move to a Location on Green Bay %	Move to a Location Not on Green Bay %	Stop Participating Entirely %	Total %
Swimming						
Green Bay	6.2	14.2	27.4	37.2	15.1	100.1
Lake Michigan	4.8	14.4	9.5	60.3	11.1	100.1
Inland Lakes	5.3	12.3	6.9	62.3	13.2	100.0
Streams & Rivers	5.3	16.2	6.2	56.1	16.2	100.0
Pools	10.1	13.7	6.9	52.6	16.7	100.0
Fishing						
Green Bay	6.7	13.3	29.3	22.7	28.0	100.0
Lake Michigan	6.7	12.4	5.6	51.7	23.6	100.0
Inland Lakes	8.2	13.6	5.8	52.9	19.4	99.9
Streams & Rivers	11.9	17.2	7.5	39.2	22.4	100.2
Boating						
Green Bay	10.5	20.8	24.9	29.5	14.4	100.1
Lake Michigan	11.4	19.3	9.1	48.8	11.4	100.0
Inland Lakes	10.4	15.4	7.7	51.6	15.0	100.1
Streams & Rivers	16.1	16.9	8.9	41.1	16.9	99.9

TABLE III-10

PROSPECTS OF HAVING TO RESPOND TO WATER CONDITION DETERIORATION AT AREA USED MOST FREQUENTLY--SWIMMING, FISHING, BOATING: PERCENTS

	Already Have %	May Have to Soon %	Not Likely %	Total %
Swimming				
Green Bay	9.7	58.4	31.9	100.0
Lake Michigan	9.5	63.4	27.0	99.9
Inland Lakes	8.6	47.1	44.3	100.0
Streams & Rivers	5.4	48.4	46.2	100.0
Pools	10.4	40.5	48.9	99.8
Fishing				
Green Bay	13.3	56.0	30.7	100.0
Lake Michigan	15.7	52.8	31.5	100.0
Inland Lakes	5.8	56.3	37.8	99.9
Streams & Rivers	12.5	50.6	36.9	100.0
Boating				
Green Bay	5.9	64.0	30.1	100.0
Lake Michigan	10.2	55.8	34.0	100.0
Inland Lakes	9.8	58.0	32.2	100.0
Streams & Rivers	11.0	58.7	30.2	99.9

to hypothetical questions may be unrelated to actual behavior changes in the future. Also, responses to "what would you do if . . ." questions may be influenced by the respondents' estimate of the likelihood that the particular situation will arise.

Swimmers Primarily[3]

When swimmers primarily were asked to evaluate water quality conditions at the location they used most frequently, over half (57%) indicated that there had been no change since they started swimming there. One-third (33%) indicated that conditions had worsened; this was a more frequent reply from Green Bay or Lake Michigan swimmers than those who used other locations. In fact, among Green Bay swimmers 50% indicated that conditions had worsened. It should be remembered that in this activity category, "pools" was an added location variable. If this variable had not been included, the percentage would have been higher.

Only a very small percentage of swimmers (7%) reported that they would not be bothered by deteriorating water conditions at the location they use most frequently. Not surprisingly, a larger proportion of this group were pool users who were accustomed to constant water quality with little prospect of significant deterioration. The overwhelming majority (93%) reported that deteriorated water conditions would result in one of four possible modifications. Fourteen percent would continue to use the same location but swim less, 55% would move to a new location but not on Green Bay, 10% would move to a new location on Green Bay, but

15% would give up swimming. Respondents, grouped by the water body location used most frequently, were not distinguished from each other in their reaction to water quality deterioration.

In response to the question probing the prospects of when they might have to respond to deteriorating water quality, 56% of the swimmers indicated that they had already made that decision or would have to soon. In terms of location differences, swimmers using either Green Bay or Lake Michigan as their primary location reflected less confidence than the total sample of swimmers by more frequently indicating that they would soon have to respond to deteriorating water conditions.

Fishermen Primarily

When fishermen primarily were asked to evaluate water quality conditions at the location they used most frequently, a larger proportion of Green Bay users compared to any other location group indicated that water conditions were getting worse. Fishermen using streams and rivers as their primary location, on the other hand, were least likely to report deteriorating water quality conditions. Among the small proportion of fishermen who indicated that conditions were improving at the location they used most frequently, Green Bay users were under-represented. In other words, nearly all who reported improving conditions could be accounted for by users of Lake Michigan, inland lakes, and streams and rivers.

When fishermen were asked what they would do if water conditions deteriorated at the location they used most frequently, a small percentage (9.4%) reported that it would not bother them. The largest proportion of this small group were users of streams and rivers than any other location. Again, the

overwhelming majority (90%) reported that deteriorated water conditions would result in modifications of their fishing activity. Among fishermen at all locations, 15% would continue to use the same location but fish less, 43% would move to a new location but not on Green Bay and 22% would give up fishing. The decision to move to another location on Green Bay was indicated by more Green Bay fishermen than users of any other location. In contrast, the decision to move to another location not on Green Bay was indicated less by Green Bay fishermen than users of any other location. Green Bay fishermen, it can be reasoned, are loyal to their location perhaps as a function of the type of fishing experience afforded. For them to move to an alternate location such as inland lakes or Lake Michigan would entail different species of fish and types of equipment and, in general, a different type of fishing. This loyalty to a location in the face of deteriorating conditions is probably characteristic for all fishing location groups. However, because of the Green Bay focus of this study, this could be substantiated with data only for Green Bay fishermen.

Students who fished were asked to evaluate prospects of when they might have to respond to deteriorating water quality. Users of all locations were generally pessimistic in that a majority of them indicated that they had responded or would soon have to respond to deteriorating water conditions. Among fishermen at all locations, only 35% saw no immediacy in making a decision. Inland lakes users were less pessimistic than users of any other location in that a smaller proportion of the former group indicated they had already made their decision. They clearly do not view inland lakes as deteriorated as users of other locations view their locations.

Boaters Primarily

When boaters primarily were asked to evaluate water quality conditions

at the location they used most frequently, a larger proportion of Green Bay users compared to any other location group indicated water conditions were getting worse. Approximately half of all location groups (50.1%) reported "no change" in the water quality at the location they used most frequently.

When boaters were asked what they would do if water conditions deteriorated at the location they used most frequently, only 11.6% across all location groups reported that "it wouldn't bother me." The overwhelming majority (88.4%) of boaters reported that deteriorated water conditions would result in a modification of their boating behavior. Among boaters at all locations, 17% would continue to use the same location but boat less, 44.4% would move to a new location but not on Green Bay, 12% would move to a new location on Green Bay, and 15% would give up boating. Analysis revealed that again location groups were not distinguished in their reactions to water quality deterioration.

Over two-thirds (68%) of the boaters at all locations indicated that deteriorating conditions had already necessitated or would soon necessitate a decision on their part. Since all location groups were equally pessimistic, there were no distinguishing characteristics between them. This might be explained by this group's relative mobility. Boaters would appear to be less restricted to one location than either swimmers or fishermen and, as a result, their optimism-pessimism regarding water quality is not as likely to be location specific but rather reflect more generalized water quality concerns.

When Tables III-8, 9, and 10 are analyzed by location, the contrast between Green Bay and inland lakes users across all activities is most worthy of

reporting. Green Bay users were more likely to report that water conditions had gotten worse, that they were more likely to move to another location on the Bay in response to deteriorating water quality, and that they felt they would have to make this move soon. In general, those who used Green Bay as a primary location for their activity, reflected a lack of confidence in that location. That is, it has or would soon deteriorate. The fact that they continue to use the Bay as their primary location despite their lack of confidence might be attributed to their age and lack of mobility. With adulthood and increased mobility, they will have other more attractive location options available to them. In comparison, users of inland lakes were more likely to report stable water quality conditions at their location and less likely to indicate deteriorating conditions. If water conditions did deteriorate they were less likely to move to a location on Green Bay but more likely to move to an alternate inland lake location. This group's confidence in their primary location, inland lakes, is demonstrated by the fact that fewer of them had made or anticipated making a decision in response to deteriorating water quality.

REFERENCES

1. Ditton and Goodale - Marine Recreation Uses of Green Bay: A Study of Human Behavior and Attitude Patterns. (pp. 60-64).

2. A mimeographed summary of responses by county of residence are available from the authors through the University of Wisconsin Sea Grant Program.

3. "Swimmers primarily" is a term used to identify those participants who engaged in swimming more than any other activity probed.

CHAPTER IV

BETWEEN GROUP DIFFERENCES

Low Participants and High Participants

Of the 1031 high school students sampled, 989 or 95.8% had participated in one or more of the six water-based recreation activities studied. Since there were so few nonparticipants (42), chi-square analysis of between group differences would be meaningless and, therefore, was not conducted.

In order to make comparisons possible, those who had not participated were grouped in the analysis with those who had participated no more than one time in any activity during the previous twelve months. This group was designated "Low Participants" and contained 112 individuals. This group was compared on twenty-two variables to the remaining individuals, "High Participants" (two or more occasions in any one activity), using a chi-square analysis. The results of the analysis are presented in Table IV-1.

With regard to county of residence, significant differences can be explained by the fact that students from Kewaunee County were more likely than would be expected to be in the "Low Participants" group and students from Door and Oconto Counties were less likely to be "Low Participants." Students from Brown and Marinette Counties were not distinguished from the total sample. While the large proportion of "High Participants" in Door and Oconto Counties can be explained by the greater availability and variety of recreation resources, this rationale does not seem to apply to Marinette County with its wide variety of water recreation resources. In comparison Kewaunee County, while adjacent to Lake Michigan, does not afford as many water recreation opportunities for participation.

TABLE IV-1

LOW PARTICIPANTS COMPARED TO HIGH PARTICIPANTS

Card Question No.		X^2	d.f.	Sig.
1-7	Place of Residence	42.43	5	.001
1-15	Age	3.26	4	NS
1-16	Sex	6.66	1	.01
1-20	Year in School	.18	1	NS
1-21	General Description of Green Bay Waters	4.09	6	NS
1-25	Summer Employment	1.18	2	NS
2-15	Car Ownership of Household	5.46	8	NS
2-16	Snowmobile Ownership of Household	4.29	6	NS
2-18	Waterski Ownership of Household	21.67	7	.01
2-19	Camping Trailer Ownership of Household	2.28	5	NS
2-21	Boat Ownership of Household	29.15	3	.001
2-36	Fund Increase for Improving Water Quality	11.47	6	NS
2-37	Fund Source for Improving Water Quality	3.85	7	NS
2-38	Bay Use Location Determinants	2.21	3	NS
2-39	Bay Physical Characteristics Most Bothersome	2.60	5	NS
2-40	Bay Water Quality Characteristics Most Bothersome	1.94	4	NS
2-43	More Boating Desire	33.85	1	.001
2-44	Deterrents to More Boating	37.41	6	.001
2-51	More Fishing Desired	8.82	1	.01
2-52	Deterrents to More Fishing	14.53	8	NS
2-60	More Swimming Desired	9.86	1	.01
2-61	Deterrents to More Swimming	38.32	7	.001

Males and females were not equally distributed among the two groups. Females were overrepresented and males were underrepresented among the "Low Participants." For a complete presentation and discussion of sex differences on the 22 variables included in this analysis, refer to Table IV-4 and pages 64-68.

When the two groups were compared on recreational equipment ownership, significant differences appeared on two of five variables. In terms of boat and waterski ownership, "Low Participants" were more likely to come from nonequipment owning households. The analysis revealed interestingly that for boaters membership in the high participation group was not primarily determined by access to a large number of boats (two or more) but rather access to at least one boat. Alternately, for waterski ownership, membership in the high participation group was a function of the number of pairs of waterskis owned. Fourteen percent of the "High Participants" group owned two or more pairs of waterskis while this was the case for none of the "Low Participants."

Six variables dealing with respondent attitudes and perceptions were included in this analysis (Card Question No.'s 1-21, 2-36, 2-37, 2-38, 2-39, 2-40). The two groups were not significantly different on any of these variables. It can be concluded, therefore, that degree of participation does not lead to a differention on these variables between the groups. This may be explained several ways. First of all, the high degree of similarity in both age and educational level may mitigate against differentiation based on the level of participation. The lack of significant differences between high and low participation groups may be related to the recent efforts of schools to create a higher level of environmental awareness. It might be reasoned that prior to these recent efforts that high and low participants might have been differentiated in their attitudes and perceptions.

Secondly, by collapsing across important distinctions like kind and location of water-based activity, to look simply at the frequency of participation

level differences may be clouded. This is not to say that differences don't exist but rather that they don't exist by level of participation. A focus on participation at a particular location provides a more sensitive measure of comparison of groups and yields significant differences. This was done for Bay users and nonBay users in a subsequent analysis (Table IV-2).

Respondents were asked if they would like to have participated more frequently than they did in swimming, boating, and fishing and if so, to indicate what deterred them. In desiring more activity, "High and Low Participants" differed significantly for all three activities probed. For each activity "Low Participants" were more likely than would be predicted to indicate they did not desire more activity and conversely less likely to indicate they wished to participate more. "Low Participants" compared to "High Participants," it would appear, are more content with their particular level of activity.

In terms of why they were deterred, significant differences were found for boating and swimming. For boating, "Low Participants" were overrepresented among those who gave "not popular with my family" as a reason for not participating more. For swimming, "Low Participants" were overrepresented among those who said they wanted to swim more but were not very good swimmers. For swimming, other reasons cited by "Low Participants" in order of decreasing frequency were "crowded facilities," "dirty water," "too far to travel," "not interested," "water is too cold," and "poor health." Deterrents to more participation in fishing were not significantly different between "High and Low Participants."

Bay Users and NonBay Users

The 989 individuals who were identified as participants were divided into two groups depending on whether or not they had used the Bay for any activity during the past twelve months. This yielded 436 Bay users and 553 nonBay users, and the two groups were compared on the same twenty-two selected variables as previously identified using chi-square analysis (Table IV-2).

TABLE IV-2

BAY USERS COMPARED TO NONBAY USERS

Card Question No.	Variable	X^2	d.f.	Sig.
1-7	Place of residence	236.14	5	.001
1-15	Age	4.15	4	NS
1-16	Sex	10.57	1	.01
1-20	Year in school	.91	1	NS
1-21	General description of Green Bay waters	80.20	6	.001
1-25	Summer employment	6.88	2	.05
2-15	Car ownership of household	9.26	8	NS
2-16	Snowmobile ownership of household	3.65	6	NS
2-18	Waterski ownership of household	29.03	7	.001
2-19	Camping trailer ownership of household	.48	5	NS
2-21	Boat ownership of household	22.84	3	.001
2-36	Fund increase for improving water quality	8.47	6	NS
2-37	Fund source for improving water quality	11.41	7	NS
2-38	Bay use location determinants	4.16	3	NS
2-39	Bay physical characteristics most bothersome	12.11	5	.05
2-40	Bay water quality characteristics most bothersome	16.37	4	.01
2-43	More boating desired	2.84	1	NS
2-44	Deterrents to more boating	22.37	5	.001
2-51	More fishing desired	.01	1	NS
2-52	Deterrents to more fishing	11.92	7	NS
2-60	More swimming desired	.00	1	NS
2-61	Deterrents to more swimming	14.80	6	.05

Proportions of Bay users by county of residence varied significantly ($p < .001$). Among students in Door County, 84.3% reported using the Bay at least once during the previous twelve months compared to Kewaunee and Marinette Counties where 11.8% and 20.8%, respectively, had used the Bay. These findings would appear reasonable since Kewaunee County has just a few miles of Bay shoreline on its northwest boundary, while Door County has over 100 miles. More importantly, residents of Kewaunee County may not consider the Bay as an important location for water-based recreation. This may be an outgrowth of a long-standing orientation toward Lake Michigan for water-based commerce and activity among the residents of Kewaunee County.

In Door County the water temperature and the extent of water recreation facilities favor the Bay side of the peninsula. In addition to these considerations, Door County has few streams and rivers or inland lakes. Therefore, from what is available to the students of Door County, the Bay is an attractive alternative. [2]

Males were more likely to be Bay users than were females ($p < .01$). Among males 53.1% were Bay users while only 42.5% of females used Green Bay for recreation activity.

When asked to describe the quality of Bay water, the two groups differed significantly ($p < .001$). On a clean-dirty continuum, nonBay users were more likely than Bay users to indicate the extremes. Correspondingly, Bay users were more likely to indicate middle values on the same continuum of Bay water quality. In addition, 12.3% of nonBay users indicated "don't know" compared to .9% of Bay users who didn't know about Bay water quality. It should be pointed out that this question was put in open-ended fashion and coded later. The finding that Bay users were more moderate in their general evaluation of Bay water quality may be accounted for by either their greater familiarity with Bay waters, or as a justification for their own use of that waterbody. NonBay users, alternately,

were either generous or harsh in their judgements of Bay water quality. This similarly might be explained by their lack of knowledge or as a justification for their nonuse of the Bay remembering that non Bay users do use alternate water locations that by comparison are more attractive. Since nearly all of those indicating "Don't Know" in response to this question were nonBay users, it is quite likely that many of the harsh or generous judgements indicated that they, in fact, didn't know much about the Bay.

Physical, chemical and biological scientists have comprehensively described the variations in the water quality of the Bay. These variations were more likely to be recognized by Bay users than nonBay users, perhaps due to the former group's first-hand knowledge of the Bay. The "Depends on Location" alternative which demonstrated that the respondent recognized the considerable variability in Green Bay's water quality was more likely to be cited by Bay users (78.3%) than nonBay users (22.7%).

Bay users differed significantly from nonBay users in terms of whether they had held a full-time job during the previous summer ($p < .05$). Bay users were more likely than would be predicted by chance to have had a job and nonBay users were more likely to not have been employed full time.

Five questions concerning the ownership of recreation equipment by the student's household were posed to respondents. It was felt that it would be more revealing to probe the ownership of such equipment by households where the students might have access than their personal ownership of equipment. When Bay users and nonBay users were compared on these questions, they differed significantly at the .001 level on two variables, namely, waterski ownership and boat ownership. It was found that 29.4% of Bay users' households owned waterskis compared to 15.5% of households of nonBay users. The majority (60.4%) of Bay users' households owned boats compared to 39.4% ownership by households of nonBay users.

Significant differences were not found between the two groups in terms of changes in the amount of funding for improving water quality or in terms of the potential program source of such funds.

The two groups differed significantly in identifying the physical characteristics of the Bay which would be most bothersome to users ($p < .05$). NonBay users differed from Bay users in that the former group was more concerned than Bay users with smell. The fact that nonBay users are more concerned with "unpleasant smell" than Bay users may begin to explain the former group's use of alternate waterbodies for recreation. Among the few individuals who indicated a strong concern with wind and waves a disproportionate majority of those were Bay users. The practical constraints on Bay use such as winds and waves are primarily the concern of Bay users who have more than likely experienced both.

In addition, the two groups differed in their indication of water quality characteristics considered most bothersome ($p < .01$). A higher proportion of Bay users than nonBay users were most bothered by dead fish while a higher proportion of nonBay users than Bay users were most bothered by suds, film or foam on the water.

Bay users and nonBay users, while they differ significantly in citing water quality characteristics considered most bothersome, do not do so in a readily apparent pattern. The possible influences of activity group differences must be considered as they might be more revealing.

Participants in water-based recreation activities were asked if they would like to have participated more frequently than they did in swimming, boating, and fishing, and if so, to indicate what deterred them. For swimming and boating, significant differences between Bay users and nonBay users were obtained on their identification of deterrents ($p < .05$ and $p < .001$, respectively). For swimming, Bay users were most concerned with water temperature (too cold),

followed by excessive travel distance and crowding, while nonBay users were most concerned with travel distance, followed by crowding and then cold water. Those who indicated that cold water was their major deterrent to not swimming more were likely to be Bay than nonBay users.

For boating, lack of access to a boat was the major deterrent for both groups, but Bay users were more likely to cite expense and a concern for "dirty water" than nonBay users. No differences were found concerning fishing.

Findings relative to respondents' willingness to participate more and deterrents to doing so are difficult to interpret as there is no way of determining whether or not the respondents are participants in each of the particular activities. For example, someone who had not participated in swimming during the previous year could legitimately answer these questions concerning why they didn't swim. The result was then that nonswimmers were included in the analysis of swimming deterrents, and conclusions drawn about these findings should be tempered by this knowledge.

Swimmers, Fishermen and Boaters

The 989 students who participated in water recreation activities were categorized into activity groups on the basis of which activity they participated in most frequently (number of occasions). This is subsequently referred to as primary activity. For example, an individual who participated in swimming more often than the other five water-based activities would tally in a primary swimming group rather than a group of people who simply engage in swimming. The swimming primarily classification is by definition mutually exclusive from all other primary activity groups.

Swimming was the primary activity for 741 of the 989 participants (74.9%), followed by fishing with 119 (12.0%), and by boating with 80 (8.1%). The number of students engaging primarily in waterskiing, sailing, or duck hunting was, as might be expected, considerably less. Twenty-one students (2.1%) did more water-

skiing than any of the other water-based activities studied. This was followed by sailing and duck hunting with 14 participants each (1.4%).

As can be readily seen, most of the participants are accounted for by the swimming, fishing, and boating--primarily groups (940 out of 989). Because of the low number of participants engaging primarily in waterskiing, duck hunting and sailing, between groups differences using chi-square were analyzed only for swimming, fishing, and boating.

Of the sixteen variables selected for between groups analysis, significant differences were found on four (Table IV-3). These included county of residence, sex, waterski ownership by the household, and boat ownership by the household. Boaters primarily were more likely than would be expected to reside in Brown County and less likely to be from Kewaunee or Marinette Counties. Those engaging in fishing as their primary activity were more likely than would be expected to be from Kewaunee County and less likely to be from Door and Brown Counties. No differences by county of residence were revealed for swimmers.

Regarding sex differences among primary activity groups, the vast majority of students who engaged most frequently in fishing were male. While slightly less than half of the sample were males, better than five out of six fishermen primarily were males. These findings might suggest that fishing is a male oriented activity. While women do engage in fishing they are less likely than males to engage in it more frequently than any other water-based activity. In contrast to females being underrepresented among the fishing primarily group, they were slightly overrepresented in the swimming primarily group.

The fact that no significant differences were found between activity groups in their general and specific evaluation of water quality and their priorities for

TABLE IV-3

ACTIVITY GROUPS COMPARED:
SWIMMING, FISHING, BOATING

Card Question No.		X^2	d.f.	Sig.
1-7	Place of residence	21.25	10	.02
1-15	Age	3.10	8	NS
1-16	Sex	79.52	2	.001
1-20	Year in School	.50	2	NS
1-21	General description of Green Bay waters	6.18	12	NS
1-25	Summer employment	6.32	4	NS
2-15	Car ownership of household	13.09	16	NS
2-16	Snowmobile ownership of household	15.24	12	NS
2-18	Waterski ownership of household	33.84	14	.01
2-19	Camping trailer ownership of household	.99	10	NS
2-21	Boat ownership of household	26.19	6	.001
2-36	Fund increase for improving water qualtiy	5.03	12	NS
2-37	Fund source for improving water quality	7.34	14	NS
2-38	Bay use location determinants	1.92	6	NS
2-39	Bay physical characteristics most bothersome	13.32	10	NS
2-40	Bay water quality characteristics most bothersome	5.40	8	NS

changes in funding for water quality improvement may be explained several ways. First of all, in spite of activity preferences, their responses were not uniquely different. This might be a result of a leveling effect of the educational experience on all individuals. They respond with equal awareness of environmental problems rather than in ways that can be traced to their primary activity preferences. Another explanation, perhaps a result of their young age, is that they have not had the time to become experienced participants and, therefore, do not yet reflect the characteristic attitudes that may exist in these activity groups irrespective of age.

Males and Females

Males and females were compared on twenty-one selected variables using a chi-square analysis. These findings are presented in Table IV-4.

Prior to a review of differences on the twenty-one selected variables, sex differences in recreation participation will be presented to aid in interpretation of differences found. These comparisons are found in Table IV-5. It should be noted that the largest differences occur in fishing, duck hunting, and waterskiing, with a substantially higher proportion of male participation in each.

While the largest proportion of both male and female respondents described the Bay as "dirty", they did differ significantly in the general descriptions of Bay water quality ($p < .05$). Males were more likely than would be expected by chance to indicate that the Bay waters were "clean," "reasonably clean," or "somewhat dirty." On the other hand, females were more likely to indicate that the water was "dirty." Of those 47 individuals who indicated that quality depends on location on the Bay 57.5% were males (only 46.8% of the total sample were males).

Since males are more likely than females to be Bay users as reported earlier in this report, their descriptions may have been based on more first-hand knowledge or intimate experience. Their tendency to be more lenient in their descriptions

TABLE IV-4

MALES COMPARED TO FEMALES

Card Question No.	Variable	X^2	d.f.	Sig.
1-7	Place of residence	2.69	5	NS
1-15	Age	5.94	4	NS
1-20	Year in school	.02	1	NS
1-21	General description of Green Bay waters	12.84	6	.05
1-25	Summer employment	66.34	2	.001
2-15	Car ownership of household	33.06	8	.001
2-16	Snowmobile ownership of household	14.43	6	.02
2-18	Waterski ownership of household	3.20	7	NS
2-19	Camping trailer ownership of household	1.37	5	NS
2-21	Boat ownership of household	9.43	3	.02
2-36	Fund increase for improving water quality	7.37	6	NS
2-37	Fund source for improving water quality	46.47	7	.001
2-38	Bay use location determinants	2.68	3	NS
2-39	Bay physical characteristics most bothersome	27.09	5	.001
2-40	Bay Water quality characteristics most bothersome	30.05	4	.001
2-43	More boating desired	15.05	1	.001
2-44	Deterrents to more boating	28.77	6	.001
2-51	More fishing desired	34.68	1	.001
2-42	Deterrents to more fishing	46.80	8	.001
2-60	More swimming desired	42.11	1	.001
2-61	Deterrents to more swimming	60.91	7	.001

TABLE IV-5

MALES AND FEMALES
PARTICIPATION IN SIX WATER-BASED
RECREATION ACTIVITIES: PERCENTS

Activity	Did Participate at Least Once	
	Males	Females
Fishing	82.4	44.4
Sailing	23.2	19.8
Waterskiing	41.7	34.1
Pleasure Boating	70.5	67.9
Swimming	90.5	93.3
Duck Hunting	31.5	3.3

may be a reflection of the fact that they use it together with their wish to support their decision to use it.

When asked whether or not they had held a full-time summer job, 43.4% of males indicated they were employed, compared to 19.7% of females ($p < .001$). The potential for participation in water-based activities may, therefore, be greater for males in that they can afford to own a car, purchase equipment, and have greater mobility. This is supported by the analysis of car ownership by household in which males are more likely than females to come from households with three or more cars.

In contrast, females are more likely than males to come from one or two-car households. These differences are significant at the .001 level. There is a strong possibility that for males the third or fourth car in the household is theirs. Beyond this, it is possible that males may have been more liberal in their definition of a car and included trucks, tractors, and other vehicles belonging to the household.

With regard to household ownership of other major recreation equipment a similar pattern is apparent. In the case of household ownership of snowmobiles and boats, females are more likely than would be expected by chance to come from households without snowmobiles and households without boats. As with cars, males were more likely than females to come from households with two or more pieces of such equipment. Both of these analyses on equipment ownership yielded significant differences between the two sexes ($p < .02$).

Since a larger proportion of males were participants it might be expected that they should be more concerned for water quality and be willing to allocate more funds for water quality improvement. The analysis revealed that males and females did not differ in the degree to which they wanted to change fund allocation for improving water quality. The fact that a high proportion of males had

jobs which would make them more concerned with increasing allocations of tax revenues may have offset the effect of their greater participation.

When asked about the program source of water quality improvement funds, both groups identified the space program to a greater extent than any other, but this position was more strongly held by females. Males were more likely than females to identify international aid and defense as sources of potential revenues.

While the sexes differed significantly in their identification of the most bothersome characteristics for Bay users, both groups considered "unpleasant smell" as the greatest problem, followed closely by "junk on the bottom." By inspecting the totals of the less frequently identified characteristics such as wind, waves, cold and weeds, it was found that these are more often noted by males than females, perhaps another reflection of differences in participation.

When asked which water quality characteristics were most disliked by Bay users, both groups identified "dead fish" as the most bothersome feature. This was most strongly indicated by females. Concerns over "cloudiness" and "chemicals" were predominantly reported by males.

With regard to whether or not the students wanted to have participated more in boating, fishing, and swimming, differences between males and females were all statistically significant at the .001 level. The pattern varied, however, with activity. Males indicated more strongly than females that they wanted to boat and swim more often during the previous twelve months, while females were more apt than males to indicate they wanted to fish more. One explanation of the differences found for fishing might be that males didn't desire more fishing since they fish so much already, while for many females, fishing may be an infrequent experience.

Juniors and Seniors

Students in their last two years of high school were compared on the twenty-two selected variables using a chi-square analysis. The results of the analysis are presented in Table IV-6 and indicate that year in school did not differentiate the respondents on twenty-one of these variables. They did differ, however, when asked to identify a governmental program to serve as a source for funds for improving water quality. The majority of both groups identified the space program, but juniors were more likely than seniors to identify the programs of education, health, agriculture, or community development, and less likely than seniors to identify the source as the defense program. These differences were significant at the .01 level. The normal pattern for high school seniors in Northeastern Wisconsin is probably the same as elsewhere with a course on American government during their last year. The increased information concerning programs and their budgets that would be the result of such a course might dispose a greater proportion of seniors compared to juniors to identify the defense program with its sizeable budget as the source of water quality improvement funds.

Owners and Nonowners of Boats

The respondents were identified as belonging to households with or without boats. Several questions were put to respondents about the ownership of recreation equipment. Of the 1031 respondents 428 reported that their household owned at least one boat. These students were compared with students from nonboat-owning households using a chi-square analysis. As presented in Table VI-7, the results of the analysis indicated that ownership of a boat by the household did differentiate respondents on ten of twenty-one selected variables.

Students from Door, Marinette and Oconto Counties were more likely to be members of households with boats than would be predicted from the total sample. In addition, students from households with boats were more likely to

TABLE IV-6

HIGH SCHOOL
JUNIORS COMPARED TO SENIORS

Card Question No.	Variable	X^2	d.f.	Sig.
1-7	Place of residence	1.09	5	NS
1-15	Age	686.74	4	.001
1-16	Sex	.02	1	NS
1-20	Year	--	-	--
1-21	General description of Green Bay waters	8.80	6	NS
1-25	Summer employment	3.05	2	NS
2-15	Car ownership of household	10.30	8	NS
2-16	Snowmobile ownership of household	3.68	6	NS
2-18	Waterski ownership of household	1.94	7	NS
2-19	Camping trailer ownership ofhhousehold	1.55	5	NS
2-21	Boat ownership of household	.31	3	NS
2-36	Fund increase for improving water quality	10.47	6	NS
2-37	Fund source for improving water quality	25.85	7	.01
2-38	Bay use location determinants	2.06	3	NS
2-39	Bay physical characteristics most bothersome	1.41	5	NS
2-40	Bay water quality characteristics most bothersome	3.81	4	NS
2-43	More boating desired	.24	1	NS
2-44	Deterrents to more boating	.85	6	NS
2-51	More fishing desired	.01	1	NS
2-52	Deterrents to more fishing	2.60	8	NS
2-60	More swimming desired	.00	1	NS
2-61	Deterrents to more swimming	4.04	7	NS

TABLE IV-7

STUDENTS FROM HOUSEHOLDS WITH BOATS
COMPARED TO STUDENTS FROM HOUSEHOLDS WITHOUT BOATS

Card Question No.	Variable	X^2	d.f.	Sig.
1-7	Place of residence	24.98	5	.001
1-15	Age	1.82	4	NS
1-16	Sex	4.68	1	.05
1-20	Year in school	.06	1	NS
1-21	General description of Green Bay waters	3.61	6	NS
1-25	Summer employment	5.40	2	NS
2-15	Car ownership of household	32.60	8	.001
2-16	Snowmobile ownership of household	61.90	6	.001
2-18	Waterski ownership of household	177.10	7	.001
2-19	Camping trailer ownership of household	50.03	5	.001
2-21	Boat ownership of household	--	-	--
2-36	Fund increase for improving water quality	10.99	6	NS
2-37	Fund source for improving water quality	10.68	7	NS
2-38	Bay use location determinants	8.99	3	.05
2-39	Bay physical characteristics most bothersome	11.01	5	NS
2-40	Bay water quality characteristics most bothersome	7.89	4	NS
2-43	More boating desired	1.20	1	NS
2-44	Deterrents to more boating	222.97	6	.001
2-51	More fishing desired	.13	1	NS
2-52	Deterrents to more fishing	85.84	8	.001
2-60	More swimming desired	.16	1	NS
2-61	Deterrents to more swimming	14.28	7	.05

be male. Whether or not they owned boats did not differentiate them with respect to their description of the water quality of Green Bay. The two groups appear to be equally severe in their evaluation of the Bay. If it is more likely that students with boats compared to those without have had boating experiences, then the lack of a significant difference between these two groups on their general description of the Bay perhaps indicates that the boating experiences were not related to the boaters' evaluation of Green Bay. Those students with boats compared to those without were also more likely to reside in households with two or more automobiles, and in households owning camping trailers, water skis, and snowmobiles.

When asked how the amount of funding for improved water quality should be changed or where such funds might come from, students with boats did not differ from those without.

Regarding which determinants are considered for Bay use, both groups reported that the presence of good facilities was most important, but boat owners were more concerned with proximity and less concerned with expense than would be predicted from the total sample. The reader should be cautioned against overinterpretation of this finding. The students with boats may have responded to the question on the basis of using the Bay for other activities than boating.

The two groups were not differentiated in terms of physical characteristics or water quality characteristics judged most problematical for Bay users. This supports the earlier interpretation of the lack of differences in their general descriptions of Bay waters.

As can be readily expected, the lack of a boat in the household was most frequently cited by nonboat owners as the major reason why they didn't fish or

boat more often than they did. It would be unlikely that they would respond differently. When asked why they didn't swim more often, boat owners were more deterred than nonboat owners by cold water, a fact that may be accounted for their orientation toward larger and, therefore, colder waterbodies. Students without boats were more deterred from swimming by lack of ability, perhaps a result of not having access to a boat.

Primary Location Comparisons

All participants in the three major activities (swimming, fishing, and boating) were compared according to the location they used most frequently for each activity on the selected 22 variables. The findings for the three activities are presented in Tables IV-8, 9, 10.

The relationship of place of residence and primary location for swimming was significant. Swimmers who used Green Bay and Lake Michigan as their primary location were more likely to be from Door County and less likely to be from Marinette and Oconto Counties. Door County swimmers were not likely to use inland lakes as their primary location and students from Marinette County were more likely to use streams and rivers than were any other group ($p < .001$).

Location comparisons by sex reveal that swimmers who use Lake Michigan as their primary location were more likely to be female while males were overrepresented among those who used either Green Bay or streams and rivers as their primary location ($p < .01$).

Those swimmers who used the Bay as their primary location did not evaluate the water as harshly as swimmers who used other locations (Table IV-8). Bay swimmers were more likely to describe the Bay as "reasonably clean" or "somewhat dirty" and less likely to indicate that the Bay was "dirty" ($p < .05$).

Location comparisons by equipment ownership reveal few significant differences. No differences were found with respect to the household ownership

TABLE IV-8

COMPARISON BY LOCATION
USED MOST FREQUENTLY (PRIMARY LOCATION) FOR SWIMMING

Card Question No.	Variable	X^2	d.f.	Sig.
1-7	Place of residence	289.96	20	.001
1-15	Age	8.74	16	NS
1-16	Sex	16.03	4	.01
1-20	Year in school	4.34	4	NS
1-21	General description of Green Bay waters	42.64	24	.02
1-25	Summer employment	9.31	8	NS
2-15	Car ownership of household	23.33	32	NS
2-16	Waterski ownership of household	30.96	24	NS
2-18	Waterski ownership of household	33.13	28	NS
2-19	Camping trailer ownership of household	14.24	20	NS
2-21	Boat ownership of household	48.00	12	.001
2-36	Fund increase for improving water quality	7.28	24	NS
2-37	Fund source for improving water quality	15.75	28	NS
2-38	Bay use location determinants	12.14	12	NS
2-39	Bay physical characteristics most bothersome	37.58	20	.01
2-40	Bay water quality characteristics most bothersome	21.14	16	NS
2-60	More swimming desired	6.06	4	NS
2-61	Deterrents to more swimming	66.93	28	.001

of cars, snowmobiles, waterskis and camping trailers. Boat ownership by the household yielded differences at the .001 level.

Swimmers at each location did not differ in the degree to which they would increase funding for water quality improvement, Green Bay location determinants or water quality characteristics of the Bay most bothersome. Swimmers at each location did differ in the description of physical characteristics of the Bay they considered most bothersome. As might be expected, the distinctive group in this sample of swimmers were those who used the Bay as the focal point of their activity. Green Bay swimmers, compared to the total sample of swimmers, were more likely to cite cold water, winds, waves or weeds in the water and less likely to cite unpleasant smell as most bothersome characteristics.

When swimmers were asked whether or not they desired more swimming, locational differences were not significant. However, among those who did indicate a desire for more swimming, significant differences were found among the reasons cited for not participating more ($p. < .001$). Green Bay swimmers were more likely to cite cold and dirty waters as deterrents to swimming and less likely to cite accessibility of swimming facilities. Alternately, accessibility of facilities was the most frequent reason cited by inland lake users. Lake Michigan swimmers were not likely to cite crowded facilities as a deterrent, perhaps a reflection of the sizable extent of beach areas.

As was the case with swimming, place of residence and primary location for fishing was significant ($p. < .001$; Table IV-?). Those who used Green Bay as their primary location were more likely to reside in Door County and less likely to come from Kewaunee and Marinette Counties than would be predicted from the total sample. Fishermen who based their activities on Lake Michigan were more likely to reside in Kewaunee or Door Counties and less likely to reside in Brown County and not at all likely to come from Marinette or Oconto

Counties. Inland lakes fishermen were overrepresented among Brown County respondents and underrepresented among Door and Kewaunee County respondents. Streams and rivers fishermen were most likely to reside in Marinette County and least likely to reside in Door County.

Primary locational comparisons by sex, age, year in school, or summer employment were not significant. Fishermen did not differ significantly in their general description of Green Bay waters. They also did not differ on whether they would increase funding for water quality improvement, Green Bay location determinants, water quality characteristics of the Bay most bothersome, physical characteristics of the Bay most bothersome, whether or not they desired to fish more, and if they did, the reasons for not participating more.

Only three significant differences occurred when boaters were compared according to their primary location (Table IV-10). These included county of residence (.001) general description of Green Bay waters (.02), and physical characteristics of Green Bay found most bothersome (.01). Beginning with county of residence, Green Bay boaters were more likely than would be predicted to reside in Brown and Door Counties and not at all likely to reside in Kewaunee, Oconto and Marinette Counties. Lake Michigan boaters were overrepresented among Door and Kewaunee County students and underrepresented in the other three counties. Inland lakes boaters were more likely to be from Brown County and less likely to be from Door and Kewaunee Counties than the boating sample would predict. Finally, boaters who use streams and rivers as their primary location are more likely to reside in Marinette and Oconto Counties and less likely than would be expected to come from Brown and Door Counties.

When asked to provide a general description of Green Bay waters, students using Green Bay as their primary boating location were more likely than would be expected to cite the "depends on location" alternative, and not at all likely to

TABLE IV-9

COMPARISON BY LOCATION USED MOST FREQUENTLY (PRIMARY LOCATION) FOR FISHING

Card Question No.	Variable	X^2	d.f.	sig.
1-7	Place of residence	18.70	15	.001
1-15	Age	8.77	12	NS
1-16	Sex	.43	3	NS
1-20	Year in school	2.55	3	NS
1-21	General description of Green Bay waters	22.45	18	NS
1-25	Summer employment	2.69	6	NS
2-15	Car ownership by household	15.80	24	NS
2-16	Snowmobile ownership by household	9.35	18	NS
2-18	Waterski ownership by household	17.01	21	NS
2-19	Camping trailer ownership by household	5.47	12	NS
2-21	Boat ownership by household	14.02	9	NS
2-36	Fund increase for improved water quality	8.88	18	NS
2-37	Fund source for improved water quality	18.31	21	NS
2-38	Bay use location determinant	3.27	9	NS
2-39	Bay physical characteristics most bothersome	10.61	15	NS
2-30	Bay water quality characteristics most bothersome	17.08	12	NS
2-51	More fishing desired	3.76	3	NS
2-52	Deterrents to more fishing	25.71	24	NS

TABLE IV-10

COMPARISON BY LOCATION USED MOST FREQUENTLY (PRIMARY LOCATION) FOR BOATING

Card Question No.	Variable	X^2	d.f.	sig.
1-7	Place of residence	253.01	15	.001
1-15	Age	4.48	12	NS
1-16	Sex	7.50	3	NS
1-20	Year in school	3.55	3	NS
1-21	General description of Green Bay waters	32.81	18	.02
1-25	Summer employment	1.06	6	NS
2-15	Car ownership by household	22.39	24	NS
2-16	Snowmobile ownership by household	17.20	18	NS
2-18	Waterski ownership by household	14.50	21	NS
2-19	Camping trailer ownership by household	6.95	12	NS
2-21	Boat ownership by household	16.30	9	NS
2-36	Fund increase for improved water quality	4.39	18	NS
2-37	Fund source for improved water quality	10.86	21	NS
2-38	Bay use location determinant	2.00	9	NS
2-39	Bay physical characteristics most bothersome	31.31	15	.01
2-40	Bay water quality characteristics most bothersome	19.30	12	NS
2-43	More boating desired	2.73	3	NS
2-44	Deterrents to more boating	20.35	18	NS

indicate "don't know." Boaters who used inland lakes as their primary location were more likely than expected to indicate "don't know." The latter group, because of its predominant use of inland lakes may genuninely lack information necessary to make the evaluation.

When asked to describe the Bay's physical characteristics found most bothersome, Green Bay boaters were more likely than would be expected to cite cold water, wind, waves, and weeds in the water, and less likely to cite unpleasant smell. Concern for cold water was also more likely to be cited by Lake Michigan and streams and rivers boaters.

Summary - Between Group Differences

Nine between group comparisons were completed. While each of these comparisons has been previously described in this chapter, it is appropriate to present an overview of these findings. Since questions related to water quality perceptions and attitudes are of special interest to this investigation, between group differences on these particular five questions are summarized in Table IV-11.

Table IV-11 can be viewed two ways. First, there is the degree to which the groups that were defined were differentiated in answering these five questions. Secondly, there is the degree to which questions themselves were reacted to differently.

Some of the comparisons resulted in no differentiation between groups. These included high-low participants, primary activity group membership, year in school, and primary fishing location. Boat ownership by the household accounted for a differentiation on one question only. Primary location for boating and swimming resulted in differentiation on two of the five questions. And finally, Bay users-nonBay users and sex accounted for the largest number (3) of significant

TABLE IV-11

GROUP COMPARISONS ON SELECTED QUESTIONS
RELATING TO WATER QUALITY

Group Comparisons	Description of Green Bay Waters (1-21)	Funding Change for Improved Water Quality (2-36)	Location Determinants for Bay Recreation (2-38)	Physical Characteristics Most Bothersome (Bay) (2-39)	Water Quality Characteristics Most Bothersome (Bay) (2-40)
High & Low Participants	NS	NS	NS	NS	NS
Bay Users & non-Bay Users	.001	NS	NS	.05	.01
Swimmers, Fishermen, Boaters	NS	NS	NS	NS	NS
Males & Females	.05	NS	NS	.001	.001
Juniors & Seniors	NS	NS	NS	NS	NS
Boat Owning Households & non-boat Owning Households	NS	NS	.05	NS	NS
Primary Location for Swimming	.05	NS	NS	.01	NS
Primary Location for Fishing	NS	NS	NS	NS	NS
Primary Location for Boating	.02	NS	NS	.01	NS

differentiations on the five selected questions.

With respect to the efficacy of questions in differentiating among the groups as defined, the question on funding changes for water quality improvement (2-36) did not differentiate among any of the groups in the comparisons. The questions on general description of the Bay (1-21) and physical characteristics of Green Bay most bothersome (2-39) resulted in the greatest number of differentiations(4).

Interpretation of these findings, however, is most difficult. The fact that there are so many nonsignificant results in Table IV-11 indicates that the sample is homogenous in its perceptions and attitudes regarding water quality. It appears that between group differentiation is defied no matter how the sample is sliced.

This may reflect an overall homogeneity resulting simply from the respondents' similarity in age and educational experience. Two group comparisons, namely, Bay users-nonBay users and males-females are particularly useful for differentiating within this sample. On Table IV-11 these two groups comparisons account for the greatest number of differentiations. On Tables IV-2 and IV-4 they likewise yield the greatest number of significant differentiations, 14 and 10 out of 22, respectively. This indicates that if the sample can be sliced at all, a slice by Bay use and sex will yield information which will be most descriptive of respondents.

CHAPTER V

CONCLUSIONS, IMPLICATIONS, AND CAUTIONS[1]

Conclusions

Method

An interview schedule previously developed (Ditton and Goodale, 1972) was modified for use as a questionnaire with high school students. Items such as employment and marital status were deleted and difficult coding instructions were altered so as to enable subjects to fill out the forms with minimum assistance.

In 1972-73, there were 10,650 high school juniors and seniors in the five-county area bordering the Bay of Green Bay. The area contained thirty-two public and five private high schools. The schools selected from each county formed a cluster and the students within each school formed another cluster, thus constituting a sample within a sample. Thirteen public schools were selected for the study with a sample of 100 students from each school. In addition, 50 students from each of the two private schools which were segregated by sex were identified to complete the sample. The sample of 100 in each school was divided into 25 junior females, 25 junior males, 25 senior females, and 25 senior males. The instruments were presented to groups of respondents assembled by school administrators. Of the 1400 instruments distributed, 1031 were completed and usable for analysis.

Water Recreation Participation

The student sample demonstrated a high rate of participation in water-based recreation activities. Of the 1031 respondents, 989 (95.8%) reported participation

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[1]This section, in addition to outlining conclusions, provides a brief summary of the project. It can, therefore, stand alone separate from the project report, if necessary.

one or more times during the previous twelve months in at least one of the water-based activities studied (swimming, fishing, boating, waterskiing, sailing, and duck hunting). Pointing to the overall popularity of swimming, boating and fishing, 987, or nearly all participants, engaged in one of these three activities.

Swimming was most popular among the respondents, with 949 having participated during the previous year. Swimming was followed in popularity by boating (718), fishing (641), waterskiing (387), sailing (222), and duck hunting (173). These figures indicate the number of individuals participating in each activity at least once, and do not reflect intensity of participation.

Primary Activity

Using frequency of participation data for each respondent, it was possible to determine the primary water recreation activity for that respondent. Swimming was the primary activity for 741 of the 989 participants (74.9%), followed by fishing with 119 (12.0%), and boating with 80 (8.1%). The number of students engaging primarily in waterskiing, sailing, and duck hunting was, as might be expected, considerably less. Twenty-one students (2.1%) did more waterskiing than any other water-based activity studied. This was followed by sailing and duck hunting with 14 primary participants in each activity (1.4%).

While it is important to know whether or not an activity is engaged in at all by an individual, it is more revealing to determine which activity he/she engaged in most frequently. While both measures can be used as an indication of activity popularity, the latter is more indicative of activity group membership.

Deterrents to Participation

Participants were asked to state the major reasons why they did not participate or participate as much as they wanted to in boating, fishing, and swimming. The major reasons cited for not participating were lack of ability, equipment, or interest, the third a possible function of the first two. Participants did not

swim more because of cold water and travel distance involved, did not boat more because of lack of a boat, and did not fish more because of a lack of a boat, interest, or fishing success. Only a small proportion of the total sample cited environmental concerns such as water quality and crowding as the major deterrents to participating more.

Recreational Use of Green Bay

The participation data from each respondent was broken down by location used for each activity. With these data it was possible to determine the extent to which the Bay was used at least once by participants in each activity. Among the three major activities (swimming, boating, fishing) no more than 40% of participants in any one of those activities reported using the Bay at all. This figure is exceeded only by sailors, among whom 49% reported using the Bay at least once during the previous twelve months.

Primary Location

Using the data on which location was used for each activity it was determined which location served as the focal point for each activity. While it was previously noted that a small proportion of participants used the Bay at least once, this analysis revealed that an even smaller number of individuals used the Bay as their primary location. Data indicated that among boaters, waterskiers, and swimmers, inland lakes were twice as popular as any other location. Inland lakes was also the most preferred location for sailors. The preferred location for fishermen and duck hunters was streams and rivers, with inland lakes a close second. Green Bay was the second most used location for boating, waterskiing, and sailing. The Bay was the least preferred location for fishing. Lake Michigan was not ranked higher than third among preferred locations for any activity. In spite of

size, potential, and accessibility, Green Bay and Lake Michigan were not focal points of water-based activities for the high school students.

When respondents were asked to indicate why they chose their primary location for each of three activities (swimming, fishing, boating) proximity was the most frequently reported reason. "Clean water" was the next most frequently cited reason by swimmers and boaters while fishermen were concerned with their "catch." Concern for proximity can perhaps be understood in light of the limited mobility of the student population.

Perceptions of Green Bay Water Quality

When asked to describe the waters of Green Bay the respondents were generally severe in their judgements. The answers to this open-ended question were coded into a clean-dirty continuum and it was found that 76% of the sample judged the Bay as being either "dirty" or "somewhat dirty." Only 11% indicated that the Bay was "clean" or "somewhat clean." The remainder volunteered that quality "depends on location" (5%), or "don't know" (8%). The documented sharp water quality contrasts by area of the Bay were recognized by only 5% of the sample who said "depends on location." Responses appeared to be more related to place of residence shown by the fact that a smaller proportion of Door County students indicated that the Bay was "dirty" than did students from Brown County (39% and 65%, respectively).

To better understand which characteristics of water were most bothersome or important to respondents two questions dealing with specific Bay water quality characteristics were put. Bay water quality characteristics seen as most bothersome by the students were dead fish, "junk on the bottom," and unpleasant smell. Water temperature, wind, waves, chemicals, and harmful bacteria were not recognized as first-order concerns, even though these are, in fact, potential hazards to personal health and safety.

Funding for Improved Water Quality

When respondents were asked to indicate the degree to which they wanted to see changes in the amount of federal expenditures for improved water quality, they responded generously. The vast majority, or 92.5%, of the students favored an increase of some extent in these expenditures. When asked to identify from which government program the money for improving water quality should be taken the Space program was pointed to by over half of the sample. 86.4% of the respondents indicated that the funds should come from either the Space, Defense, or International Aid programs.

Water Condition Changes and Responses

A series of hypothetical questions were put to the students regarding changes in water quality at their primary locations, the likelihood of water quality deterioration there, and their probable behavioral responses to such deterioration. Approximately one-third of participants indicated that conditions had gotten worse at the place they usually swam, boated, or fished. Fishing would appear to be most drastically affected by deteriorated conditions in that one-fifth of the fishermen would give up their activity compared to 15% of both swimmers and boaters. The largest number reported that they would move their activity to an alternate location, not on Green Bay, if conditions deteriorated at their primary location (which was most likely inland lakes). While 40% of the swimmers indicated that a decision in the face of deteriorating water conditions would not be likely, the figures for boaters and fishermen were 26% and 28%, respectively. It is understandable that swimmers exhibited the greatest confidence in the water quality, given the fact that they use inland lakes or pools as their primary locations, where conditions are more stable.

Between Groups Differences

Nine between groups comparisons were completed resulting in varying degrees of differentiation between groups. When the sample was divided into groups of high and low participants, primary activity group membership, year in school, primary swimming location, primary fishing location, and primary boating location, there was little differentiation on selected variables. Other between groups comparisons yielded a large number of differentiations. These included Bay use-nonBay use, sex, and boat ownership. These results indicated that the sample was homogenous with respect to the variables included in the analysis. This is obviously related to the high degree of similarity in age and educational experience. For more complete discussion and summary of between groups differences refer to Table IV-11 and pages 79 to 81.

Implications

The results of this investigation have implications for education, environmental management and planning, and future research.

Education

From the conclusions it should be clear that the young people in the sample were similar in their perceptions and attitudes toward Green Bay. First of all, in their description of the Bay, the respondents overgeneralized conditions near their county of residence on the Bay to the entire Bay. In addition, they were extremely harsh in their evaluation of water quality of the Bay even though water quality varied significantly by sector of the Bay.

Secondly, they seemed to be concerned with the cosmetics of water quality in that more reported being most bothered by dead fish and unpleasant smell than by harmful bacteria or chemicals in the water, the latter long-standing

concerns of public health officials. Likewise, the findings that such a small number of respondents were primarily concerned with winds, waves, and cold water, long recognized as real hazards for Great Lakes users, have implications for the U.S. Coast Guard in their recreation safety program.

These findings on Bay water quality evaluation were not expected in light of the recent intensive environmental education efforts in the schools. Students have taken part in at least three state wide and national "Earth Day" programs, and have been constantly exposed to media efforts geared to increased environmental sensitivity. To take students beyond awareness, courses in ecology and environmental problems have been instituted in schools to transmit knowledge and develop personal values regarding the environment. Because of these efforts, it has been widely assumed that the current generation of students has reached a level of environmental awareness and knowledge previously unattained. The findings of this study indicate that while students may be concerned as shown by their willingness to have spending for water quality increased, and by the extremes in their evaluation of Bay water, they do not exhibit a level of environmental knowledge beyond that of the rest of the population. In fact, it might be reasoned that their parents, with extensive personal experience on the Bay, are better informed of water quality contrasts that do exist (Ditton and Goodale, 1972).

What is implied here is that many of the current environmental education programs might not be imparting knowledge that can be used and interpreted by students in dealing with real environmental problems. Perhaps this is due to the "hard science" approach that is often used, where technical terms and jargon are transmitted, but where students fail to convert terminology into understanding. Secondly, there are survey courses that look at environmental quality questions on a global or national level, but fail to develop understanding of specific local conditions. Another current approach to creating environmental awareness in the schools is to have students carry out an environmental "project" such as

described in environmental handbooks as being worthwhile and beneficial. While not criticizing the effectiveness of any of the specific programs, the results of this study, nevertheless, indicate that while students are aware, they are not distinguished by their ability to apply their environmental knowledge. It is not the intent here to suggest a specific alternative environmental education approach, but the data appears to support the value of intimate experience with water andother environmental resources. For example, those who reported using the Bay were significantly different than those who did not in their perceptions of water quality conditions there. It would appear, then, that participation in water-based recreation is related to greater awareness and, perhaps, greater knowledge of the elements and contrasts of water quality.

Environmental Management and Planning

If, as found, students of today are primarily concerned with the cosmetic aspects of water quality, there are several questions raised as to how water quality problems are to be solved. Decision makers may, in the face of such findings, proceed with solutions whose attraction lie in their public visibility. For example, the alternative of making water clear may be given higher priority than efforts to remedy sources of bacterial contamination, the latter being visible only to water chemists and sanitary engineers. Along this line of reasoning the public may be satisfied with efforts to improve water clarity and be reluctant to support and fund attempts to eliminate less visible contamination.

Similarly, decision makers who are already aware of water quality problems and identified and pursued solutions to those problems may find it difficult to convince the public that an improvement has been made. While considerable funds have been expended by industry and municipalities in the Fox River Valley to improve water quality, it would be exceedingly difficult to convince the general public that conditions have improved.

While the data provide no ready solutions to these dilemmas, many of the

earlier comments on environmental education might apply. Perhaps by personal experience, the elements of water quality might be better understood by individuals. Industrial and public officials must also make a more concerted effort to interpret their solutions in terms understandable to the public. For example, if a new treatment plant or process is claimed to result in an improvement of water quality, a concurrent effort to demonstrate that the water is more usable should take place. This means less emphasis on hardware displays and parameter discussions and more emphasis on improved or expanded uses of water.

Research

The completion of this report allows comparisons to be made with the data collected on heads of household in the five-county study area (Sea Grant Technical Report #217). The data base on heads of household and students provides a comprehensive picture of Bay use, water recreation behavior at all locations, and related attitudes and perceptions toward water quality.

A number of contrasts between the two samples were found. The students exhibited a considerably higher participation rate, a more diversified recreation pattern, a more severe general evaluation of Green Bay's water quality, and a greater willingness to allocate funds for water quality improvement. Whether these contrasts are due to age differences or real differences due to environmental awareness can only be ascertained through longitudinal studies in the region. While it is probable that participation rates will decline with age the magnitude of that decline is unknown. This is only one of several questions yet to be answered.

Another question concerns the perceptions and attitudes of the students. Will age, experience, and the necessity of taxes temper the severity of their judgements and their fiscal generosity? The ready answer is yes, but to conclude yes is to dismiss the current educational efforts to build environmental awareness and empathy.

Cautions

The reader should be cautioned regarding the interpretation of the findings reported in this study. Chi-square analysis was employed to compare groups within the sample, and it should be remembered that this statistic simply measures the strength of a relationship and can in no way indicate any cause-effect connection. The reader may be tempted to draw cause and effect conclusions, but these must necessarily be speculative as they are not directly testable by the data collected. If it is found, for example, that Bay users are more knowledgeable about Bay water quality than are nonBay users, it is tempting to conclude that the knowledge is a result of that use. However, even though such speculations have been discussed in the previous Implications section, they are not verifiable using the data available.

Since the use of chi-square necessitates analyses of subsets of the total sample the reader should be completely aware of the meaning of the terminology used in describing those subsets. For example, the "swimmer" classification is different from the "participant" classification and is also different from "swimmers primarily." In addition, someone who is a Green Bay user is different from one who uses Green Bay as his primary recreation location. The point here is that the report should be read slowly and in its entirety and that statistics should not be separated from the groups and individuals they describe.

The findings in this investigation refer only to high school students who reside in the five-county area adjacent to the Bay of Green Bay and are not intended to describe any other population. They may, however, be useful for hypothesizing water recreation trends and attitudes among other high school students elsewhere. The data collected reflect present behaviors, attitudes, and perceptions as reported by high school students and should not be taken as indications of what will be or ought to be. The fact that the Bay of Green Bay is not presently the focal point for water-based recreation among high school students does not mean that at some future time, given changing circumstances,

it cannot become highly regarded.

Similarly, the fact that the Bay is not the focal point for an activity does not imply that it is not used for recreation but simply not used heavily by the sample studied. Here it should be remembered that seasonal residents or transient young people were not studied and if they were, it might be found that the Bay was heavily used. To determine total use, other methods such as observations or counts would need to be employed.

The reader should be cautioned regarding several methodological elements in the report. These deal primarily with how questions may have been interpreted as well as the questionnaire format. There is an obvious reliance on the respondents' recall of their participation during the previous twelve months. Anyone who has tried to recall such information appreciates the related difficulties. The dependence on recall was, nevertheless, the only practical means for gathering the data needed. It is possible, therefore, that respondents were unable to recall exactly how often they participated in a particular activity. In anticipation of this problem, participation rate responses were coded into broader categories so as to better allow for discrepancies in recall.

In addition, respondents might have misinterpreted some questions, particularly those relating to equipment ownership and the primary location of their activity. Questions probing the former dealt with equipment owned by the household and it is possible these questions may have been interpreted for the extended family rather than the household. When asked about the location where they usually participated in an activity, the respondents may not have correctly reflected the location actually used most often (as revealed by their responses regarding their participation rates by location).

Caution should be exercised in interpreting the responses of the students regarding what they would do in the face of certain conditions. It has long been known that there may be little correspondence between what people say they would do and what they actually do. Recognizing this, it is still important to have

some knowledge of what the behavior might be in order to make testable predictions possible. While the present findings reflect what students say they would do, actual observation and recording would be necessary to verify these hypothetical responses.

UNIVERSITY OF WISCONSIN SEA GRANT PROGRAM

WATER RECREATION - HIGH SCHOOL PROJECT
1972 - 1973

2201

1
2
3
4
5 1

6 What is your year around address?

_____ / _____
city, village, town/state

7 Which county do you live in? (Circle one)
1. Brown Co.
2. Door Co.
3. Kewaunee Co.
4. Marinette Co.
5. Oconto Co.
6. Outside five-county area

8
9

10 How many years have you lived in the five-county area?
(Brown, Door, Kewaunee, Oconto, Marinette)
1. None
2. 0 to 3 years
3. 4 to 10 years
4. 11 to 20 years

11 Does your family own a camp or cottage for weekend or seasonal use?
1. Yes
2. No (Skip to No. 15)

12 Where is it located?
1. Brown Co.
2. Door Co.
3. Kewaunee Co.
4. Oconto Co.
5. Marinette Co.
6. Elsewhere in Wisconsin
7. Outside Wisconsin

13

14 How many days per year do you use it?
0. Not used
1. 1-7 days
2. 8-14 days
3. 15-21 days
4. 22-28 days
5. 29-35 days
6. Over 35 days

15 How old are you?
1. Under 16
2. 16
3. 17
4. 18
5. 19 or over

16 What is your sex?
1. Male
2. Female

17
18
19

20 What is your year in school?
1. Junior
2. Senior

21 How would you describe the water quality of the Bay of Green Bay? (Write in)

_____

_____

22
23
24

25 Were you employed full time this past summer? (40 hours per week or more)
1. Yes
2. No

26 For each of the following locations, how many times did you go fishing during the last 12 months? Estimate the number to the best of your ability and write these numbers in the blanks provided. (If none, write 0. Do not leave blanks.)
On Green Bay_____
27 Elsewhere on Lake Michigan_____
28 Inland lakes_____
29 Streams or rivers_____
30

31 During the last 12 months, how many times did you go sailing? (Follow the same procedure as above.)
On Green Bay_____
32 Elsewhere on Lake Michigan_____
33 Inland lakes_____
34 Streams or rivers_____
35

36 During the last 12 months, how many times did you go waterskiing? (Follow the same procedure as above)

On Green Bay_____

37 Elsewhere on Lake Michigan_____

38 Inland lakes_____

39 Streams or rivers_____

40

41 During the last 12 months, how many times did you go pleasure boating? (Follow the same procedure as above)

On Green Bay_____

42 Elsewhere on Lake Michigan_____

43 Inland lakes_____

44 Streams or rivers_____

45

46 During the last 12 months, how many times did you go swimming? (Follow the same procedure as above)

In Green Bay_____

47 Elsewhere in Lake Michigan_____

48 Inland lakes_____

49 Streams or rivers_____

50 Pool_____

51

52 During the last 12 months, how many times did you go duck hunting? (Follow the same procedure as above)

On Green Bay_____

53 Elsewhere on Lake Michigan_____

54 Inland lakes_____

55 Streams or rivers_____

56

57

58

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1
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5 2
6
7 Did you fish on Green Bay during the last 12 months?
1. Yes
2. No (If No, skip to No. 9)

8 If yes above, where on the Bay did you fish most often? Consult the map provided to identify the five areas of the Bay. (Choose one)
1. Area 1
2. Area 2
3. Area 3
4. Area 4
5. Area 5

9 Did you go pleasure boating on Green Bay during the last 12 months?
1. Yes
2. No (If No, skip to No. 11)

10 If yes above, where on the Bay did you go pleasure boating most often? Consult the map provided to identify the five areas of the Bay. (Choose one)
1. Area 1
2. Area 2
3. Area 3
4. Area 4
5. Area 5

11 Did you go swimming in Green Bay during the last 12 months?
1. Yes
2. No (If No, skip to No. 15)

12 If yes above, where on the Bay did you go swimming most often? Consult the map provided to identify the five areas of the Bay. (Choose one)
1. Area 1
2. Area 2
3. Area 3
4. Area 4
5. Area 5

13
14

15 How many cars do members of your household own? (Write the number in the blank)
_____cars

16 How many snowmobiles do members of your household own? (Write the number in the blank)
_____snowmobiles

17

18 How many pairs of water skiis (or single slalom skiis) do members of your household own? (Write the number in the blank)

_____pr. water skiis

19 How many camping trailers or units do members of your household own? (Write the number in the blank)

_____camping trailers or units

20

21 How many boats are owned by members of your household?

0. None (Skip to 36)
1. 1
2. 2
3. 3 or more

22 What kind of boat is it? (If your household owns two or more boats, which one is most important to you?)

1. Sail
2. Inboard
3. Outboard
4. Canoe
5. Other

23 How long is it?

1. Up to 17 feet
2. 17 ft. to 25 ft.
3. Over 25 ft.

24 What is it made of?

1. Wood
2. Aluminum
3. Fiberglass
4. Other

25 Is it usually transported (trailer) or left in place?

1. Transported
2. In place

26

27

28

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36 At the present time, less than one cent out of each federal dollar goes for improving water quality. How do you feel this amount should be changed? (Choose one)

1. Decrease a lot
2. Decrease quite a bit
3. Decrease a little
4. Maintain the present level
5. Increase a little
6. Increase quite a bit
7. Increase a lot

37 If more were to be spent on improving water quality without raising taxes, the money would have to be taken from some other government program. Which of these programs would you take the money from? (Choose one)

1. Education
2. Transportation
3. Defense
4. Health
5. International Aid
6. Space
7. Agriculture
8. Community Development

38 Which of these do you think is most important in determining where people go for water recreation on the Bay? (Choose one)

1. Area is close by
2. Not too expensive
3. Good facilities
4. Area is not too crowded

39 Which of these do you think is the biggest problem for people who use the Bay for water recreation? (Choose one)

1. Water is too cold
2. Unpleasant smell
3. Winds
4. Waves
5. Junk on the bottom
6. Too many weeds

40 Which of these do you dislike most about the Bay? (Choose one)

1. Water is cloudy
2. Chemicals
3. Harmful bacteria
4. Suds, film, or foam on the water
5. Dead fish

41 How many times did you go pleasure boating last year?

1. Many times (Skip to No. 43)
2. A few times (Skip to No. 43)
3. None

42 If none, what is the main reason you did not go boating last year? (Choose one)

1. Not interested
2. Poor health
3. Water is too dirty
4. Don't have a boat
5. Have to travel too far
6. Too expensive

43 Would you like to have gone pleasure boating more often than you did last year?

1. No (Skip to No. 45)
2. Yes

44 Why didn't you go boating more often? (Choose one)
1. Don't have a boat at my disposal
2. Places are too crowded
3. Water is too dirty
4. Boating is not popular with my family
5. Too expensive
6. Too far to travel

45 When did you last go boating? _____years ago, or _____months ago.
(If more than 3 years ago, skip to No. 49) Thinking only of the area where you do most of your pleasure boating, why do you prefer that area to some other area? (Choose one)
1. Good launch or marina facilities
2. Close by
3. Water is cleaner there than elsewhere
4. Pretty place
5. Not too crowded
6. Friendly people

46 How have conditions changed where you usually go boating since you started going there? (Choose one)
1. No change
2. Better
3. Worse

If better or worse, in what way?

_____

_____

47 What would you do if water conditions deteriorated at the place you usually go pleasure boating? (Choose one)
1. Stay in the same place, but not boat as much
2. Move to somewhere on Green Bay
3. Go someplace, but not on Green Bay
4. Wouldn't bother me
5. Give up boating

48 Do you think water conditions will become bad enough that you will have to make that decision soon? (Choose one)
1. Already have
2. May have to soon
3. Not likely

49 How many times did you go fishing last year?
1. Many times (Skip to No. 51)
2. A few times (Skip to No. 51)
3. None

50 If none, what is the main reason you did not go fishing last year? (Choose one)
1. Not interested
2. Never catch anything
3. Have to travel too far
4. Good spots too crowded
5. Poor health
6. Too expensive
7. Water is too dirty
8. Don't own a boat

51 Would you like to have gone fishing more often than you did last year?
1. No (Skip to No. 53)
2. Yes

52 If yes, why didn't you? (Choose one)
1. Poor health
2. Too far to travel
3. Don't own a boat
4. Good spots are too crowded
5. Never catch anything
6. Too expensive
7. Water is too dirty
8. Family or friends are not interested

53 When did you last go fishing? _____years ago, or _____ months ago.
(If more than 3 years, skip to No. 58)
Thinking only of the area where you do most of your fishing, why do you prefer that area to come other area? (Choose one)
1. Close by
2. Catch more fish
3. Not too crowded
4. Good launch or marina facilities
5. Cleaner water
6. Pretty spot

54 How have conditions changed where you usually go fishing since you started going there? (Choose one)
1. No change
2. Better
3. Worse
If better or worse, in what way?
_____
_____

55 What would you do if water conditions deteriorated at the place you usually go fishing? (Choose one)
1. Stay in the same place, but not fish as much
2. Move to some place on Green Bay
3. Move to some place, but not on Green Bay
4. Wouldn't bother me
5. Give up fishing

56 Do you think water conditions will become bad enough that you will have to make that decision soon? (Choose one)
1. Already have
2. May have to soon
3. Not likely

57 Is it safe to eat the fish you catch at this spot?
1. Yes
2. No

58 How many times did you go swimming last year?
1. Many times (Skip to No. 60)
2. A few times (Skip to No. 60)
3. None

59 If none, what is the main reason you did not go swimming last year? (Choose one)
1. Not interested
2. Don't know how to swim
3. Poor health
4. Have to travel too far
5. Water is too dirty
6. Good places are too crowded

60 Would you like to have gone swimming more often than you did last year?
1. No (Skip to No. 62)
2. Yes

61 If yes, why didn't you? (Choose one)
1. Water is too cold
2. Have to travel too far
3. Good spots are too crowded
4. Poor health
5. Water is too dirty
6. Not a very good swimmer
7. Family and friends are not interested

62 When did you last go swimming? _____years ago, or _____months ago.
(If more than 3 years ago, skip to No. 69)
Thinking only of the place you do most of your swimming, why do you prefer that place to other places? (Choose one)
1. Close by
2. Cleaner water
3. Pretty spot
4. Not too crowded
5. Not too expensive
6. Better facilities
7. Water is warm

63 How have conditions changed at the place you usually go swimming since you started swimming there? (Choose one)
1. No change
2. Better
3. Worse

If better or worse, in what way?

_____

_____

64 What would you do if water conditions deteriorated at the place you usually go swimming? (Choose one)
1. Stay in the same place but not swim as much
2. Move to somewhere on Green Bay
3. Go someplace else, but not on Green Bay
4. Wouldn't bother me
5. Give up swimming

65 Do you think water conditions will become bad enough so that you will have to make that decision soon? (Choose one)
1. Already have
2. May have to soon
3. Not likely

66 Could swimming at the place you usually go be harmful to a person's health?
1. Yes
2. No

67 At the place you usually swim, have you ever gotten a rash, infection, upset stomach, or other illness from the water?
1. Yes
2. No

68 Do you know anyone beside yourself who has?
1. Yes
2. No

69 If you had a perfect summer day and no work or other obligations, what would you most like to do with it? (Choose one)
1. Go fishing
2. Go sailing
3. Go canoeing
4. Go pleasure boating
5. Go swimming
6. Picnic, hike or relax next to water
7. Go for a drive
8. Other (Write in)_____

_____

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78 G
79 B
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Comments:_____

_____

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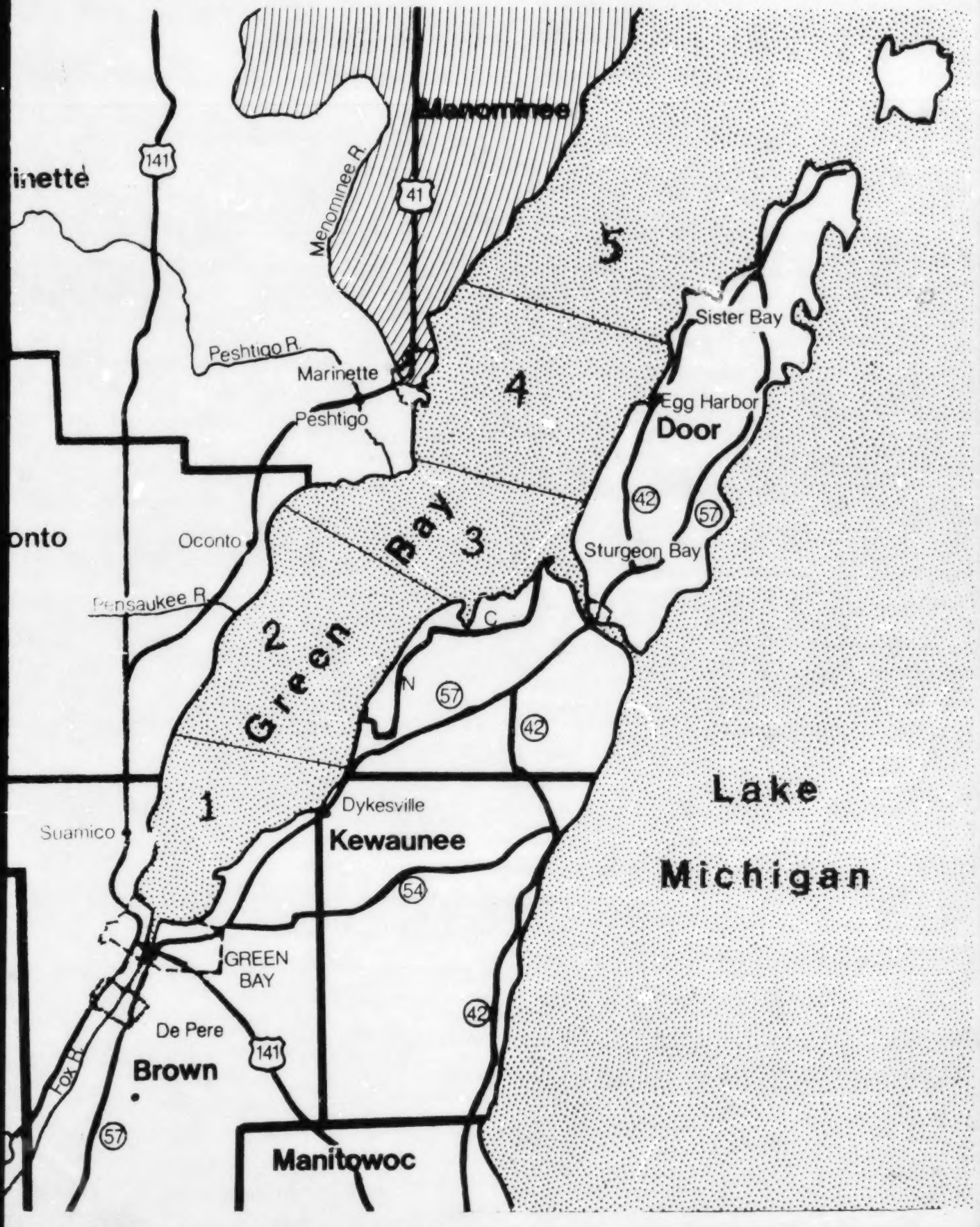

APPENDIX B

SCHOOLS IN THE SAMPLE

Brown County
1. Abbot Pennings and St. Josephs (DePere and Green Bay, respectively)
2. Southwest (Green Bay)
3. West (Green Bay)
4. East (Green Bay)
5. Bay Port (Howard-Suamico)

*Alternate - Preble (Green Bay)

Door County
1. Sturgeon Bay
2. Gibralter

*Alternate - Sevastapol

Kewaunee County
1. Algoma
2. Kewaunee

*Alternate - Luxemburg-Casco

Marinette County
1. Pembine
2. Peshtigo
3. Crivitz
4. Niagara

*Alternate - Coleman

Oconto County
1. Suring
2. Oconto

*Alternate - Gillett

*None of the alternate schools chosen were needed to complete the sample

BIBLIOGRAPHY

Public Documents

State of Wisconsin. An Act ... relating to lowering the age of majority from 21 years of age to 18 years. Chapter 13, Laws of 1971, published March 22, 1972.

Articles and Periodicals

David, E.L. "Public Perceptions of Water Quality." Water Resources Research, 7 (3) (June, 1971), 453-457.

Swan, J.E. "Response to Air Pollution: A Study of Attitudes and Coping Strategies of High School Youths," Environment and Behavior, 2 (2) 127-152.

Towler, J. and Swan, J.E. "What do People Really Know About Pollution?" J. Environmental Education, 4 (1), 54-57.

Reports

Bishop, D.W. and Aukerman, R. Water Quality Criteria for Selected Recreational Uses. Research Report No. 33. Urbana: Water Resources Center, University of Illinois, 1970.

Ditton, R.B. and Goodale, T.L. The Marine Recreational Uses of Green Bay: A Survey of Human Behavior and Attitude Patterns, Technical Report No. 217, Madison: University of Wisconsin Sea Grant Program, 1972.

Simpson, W.G. and Kamitakahara, G.K. Opinions on Recreation and Pollution in Lake Ontario. Toronto, Canada, Great Lakes Institute, University of Toronto, 1971.

Willeke, G.E. Effects of Water Pollution in San Francisco Bay. Report EEP-29. Stanford, California: Project on Engineering-Economic Planning, Stanford University, 1968.

Unpublished Material

Barker, M.L. The Perception of Water Quality as a Factor in Consumer Attitudes and Space Preferences in Outdoor Recreation. Toronto, Canada: Unpublished report, Department of Geography, University of Toronto, 1967.